For Constipation, Gout & Rheumatism, Liver Complaints, Obesity, &c.,

PRESCRIBE

Hunyadi János

THE BEST

NATURAL APERIENT WATER.

Directions for Use.

Dose.—To relieve constipation the average dose for an adult is from a third to half a tumbler, taken on an empty stomach on rising. To obtain the depurative and tonic effects in dyspepsia, biliousness, congestion of the liver, &c., a quarter of a tumbler should be taken every morning before breakfast.

"Hunyadi János" may be taken pure or mixed with hot or cold water. If hot water be used the temperature should be high enough to make the mixture as hot as can be drunk comfortably. If cold, the water should be at the ordinary temperature, that is to say, not iced or ice-cold.

A draught of pure water, hot or cold, taken immediately after, increases the efficacy of the laxative and obviates any after-taste.

For Children.—The dose is proportional to the age. Between 5 and 10 years of age from one to two teaspoonfuls of the water which may be mixed with milk, will be sufficient. Above 12 the dose is a quarter of a tumbler, taken as above.

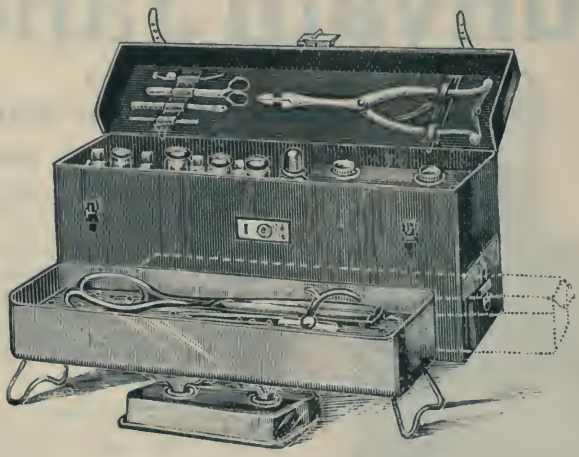
N.B.—When administered to persons in bed, somewhat larger doses are required to produce the same effect.

PROPRIETOR—

ANDREAS SAXLEHNER, BUDAPEST.

LONDON Agency: Trafalgar Buildings, Charing Cross, W.C.

Modern and Improved MIDWIFERY BAG WITH STERILIZER.



The bag is made of solid leather having a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush in plated case, Minim measure in case, Chloroform Bottle in plated case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

£3 3 0 net (with outside Canvas Cover 7/6 extra.)

R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

THE "PUTTEE" LEG BANDAGE

FOR VARICOSE VEINS, etc.

THESE are Elastic Bandages fitted with a loop for the foot, and tapes for tying.

The advantage is that the bandage is always retained in position.

They are preferable to an Elastic Stocking as they can be adjusted to any required pressure, and are cooler and lighter in weight.

They require no measurements or fitting, and are very much cheaper.

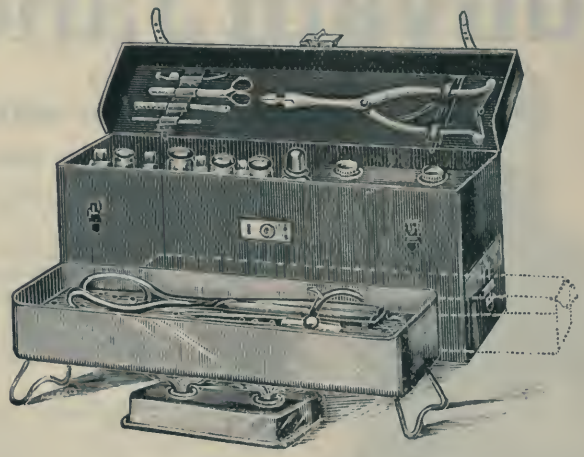
WE MAKE IN TWO SIZES.

To reach the Knee (9 feet by 2½ inches), 2/- each.
To reach the Thigh (13½ feet by 2½ inches), 3/- each.

SPECIAL SIZES MADE TO ORDER.

R. SUMNER & CO., LTD., LIVERPOOL.

Modern and Improved MIDWIFERY BAG WITH STERILIZER.



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They require no measurements or fitting, and are very much cheaper.

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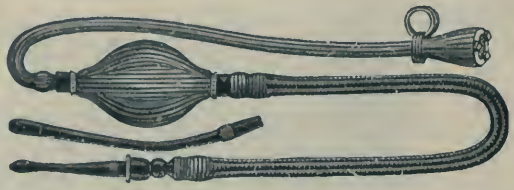
To reach the Knee (9 feet by 2½ inches), 2/- each.
To reach the Thigh (13½ feet by 2½ inches), 3/- each.

SPECIAL SIZES MADE TO ORDER.

R. SUMNER & CO., LTD., LIVERPOOL.

The "SUMNA"

Continuous-Flow Syringe



THE great and important feature of this Syringe is that it throws a **continuous stream of fluid,** and therefore supersedes all other syringes which are **intermittent** and invariably inject air which is impossible with the **"SUMNA."**

It requires less than half the exertion to work the **"SUMNA"** than it does the ordinary elastic bulb syringe, and as the **flow is continuous,** it prevents the return of fecalised fluids, etc., back into the syringe, which frequently happens with ordinary syringes, and is necessarily a source of great danger.

The "SUMNA" is made of the **Purest Sheet India-Rubber,** and far out-lasts ordinary manufactures (which are moulded), and it is therefore considerably cheaper in the end.

The sinker being covered with rubber, it does not cause the clinking so objectionable in syringes with metal sinkers.

The pipes or fittings are made of highly-polished Vulcanite.

The price of the Instrument, with Vaginal and Rectum Pipes, in case, is **8/-**

We, however, make the following additional fittings, all of which will be found **useful** to medical men, and which, together, make a most complete instrument; but any of the fittings are supplied separately.

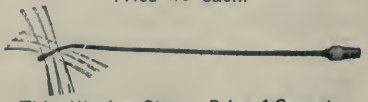
Tube for Eye, forming Douche, Price 1/- each.

Tube for Nose and Ear, forming Douche, Price 9d. each.

Junction for fitting Stopcock of Barnes' Bags. Price 6d. each.

Thick Uterine Tube, with groove for back flow. Price 2/- each.

Harrison Irrigator for the Urethra. Price 1/6 each.



Thin Uterine Stem. Price 1/6 each.

PRICE of SYRINGE, complete with all Fittings, in case, 14/-

R. SUMNER & CO., Ltd.

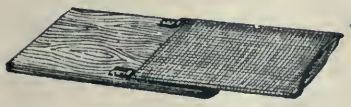
Wholesale Druggists,

LIVERPOOL.

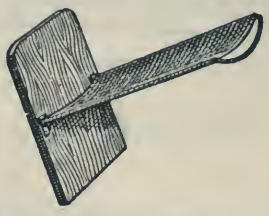
PATENT

FOLDING LEG REST

A COMFORT AND BOON TO INVALIDS.

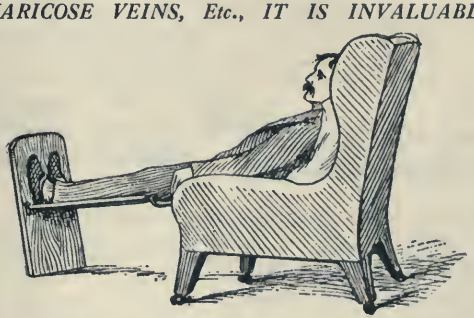


When CLOSED it can be packed in a trunk for travelling, thus ensuring a comfortable and easy Chair at all times.



When OPEN it is a supported Canvas trestle on which the legs rest with comfort without producing stiffness or stagnation.

TO SUFFERERS FROM GOUT, RHEUMATISM, VARICOSE VEINS, Etc., IT IS INVALUABLE.



It can be used with any kind of Chair, whether high or low, giving PERFECT EASE AND REST, enabling Convalescents to sit for hours without fatigue.

Recommended for use in Yachts, House Boats, Bungalows, Gardens, Seaside, Clubs, Hotels, Hydros, and Hospitals.

PRICE - **5/-** each, by post **5/6** each.

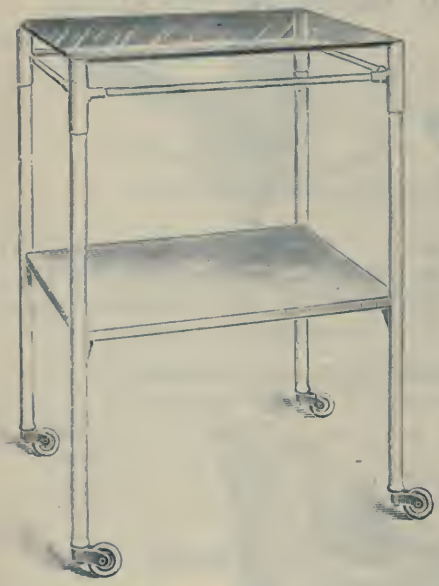
WHOLESALE AGENTS:

R. SUMNER & CO. Ltd.,

50a, LORD STREET, LIVERPOOL.

A New ASEPTIC DRESSING TABLE

(Registered Design).



These Tables have hitherto been made with the glass plate resting in a frame of the iron. By this method it was possible that if the strictest cleanliness was not observed, the crevice between the glass and iron rim might become a zone of danger: this is obviated by our NEW TABLE in which the frame is entirely done away with, and the glass plate is suspended by its extreme points on the iron work.

The corners are made of the best malleable iron castings, specially drilled to receive the tubes.

The Tables are made from the best cold-drawn steel tubes, and japanned with white enamel in stoves at a temperature that renders the surface extremely hard and lasting.

20 in. × 16 in. × 32 in.	Plate-glass Top, Iron Shelf, mounted on rubber wheels	**49/-**
„ „ „	Plate-glass Top, Plate-glass Shelf, „ „ ...	**59/-**
22 in. × 17 in. × 32 in.	Plate-glass Top, Iron Shelf „ „ ...	**54/-**
„ „ „	Plate-glass Top, Plate-glass Shelf „ „ ...	**64/-**
27 in. × 19 in. × 34 in.	Plate-glass Top, Iron Shelf „ „ ...	**57/-**
„ „ „	Plate-glass Top, Plate-glass Shelf „ „ ...	**67/-**

If required without Rubber Wheels ... **10/-** *each less.*

CARRIAGE PAID TO ANY RAILWAY STATION in the United Kingdom.

ANY SIZE OR PATTERN TO ORDER.

R. SUMNER & CO. Ltd.,

50a, LORD STREET, LIVERPOOL.

APPLICATION OF OINTMENTS

TO INTERNAL CAVITIES BY THE AID OF COLLAPSIBLE TUBES.

This method of treatment having become largely adopted, we present to the Medical profession a series of Ointments which have been thoroughly tested in the diseases indicated.

For the Urethra two kinds of Catheters are recommended:—

Fig. 1.

For GONORRHŒA and URETHRITIS.

1st.—For recent cases. A Stiff Vulcanite Catheter (*Fig.* 1) is preferred (with this instrument we supply three Catheters, and it is advisable that the largest that can be passed without pain be used).

For GLEET and Long-standing Cases of GONORRHŒA.

2nd.—A 9-in. "flexible" Catheter, and is intended for diseases far down the Urethra. Either of the above Catheters are supplied with Ointment Tubes containing the following medicaments:—

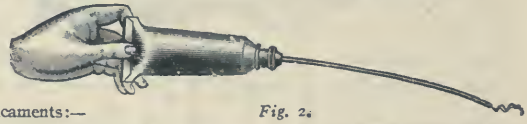


Fig. 2.

1. Iodoform & Eucalyptus
2. Do. do. and Cocaine
3. Thallin
4. Do. and Cocaine
5. Iodoform, Eucalyptus & Perchloride of Mercury
6. Dermatol
7. Aristol
8. Biniodide of Mercury
9. Hydrastin
10. Iodol and Eucalyptus
11. Sulphate of Zinc
12. Permanganate of Zinc
13. Resorcin, Hydrastin & Extract of Belladonna
14. Loretin
15. Protargol

Price complete, **5/-** each; with Cocaine, **6/-** each.
Ointment Tubes without Catheters, **1/6** each; with Cocaine, **2/6** each; by post, **3**d. extra.

In ordering please specify number of the Ointment Tubes, and also whether the Stiff Vulcanite Catheters or the Long Flexible Stem is required.

For DISEASES of the RECTUM.

Each Collapsible Tube is fitted with a specially designed Vulcanite Pipe.

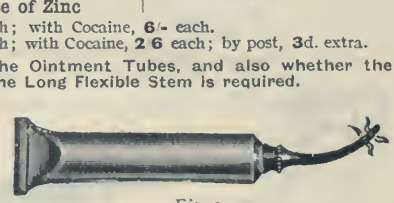


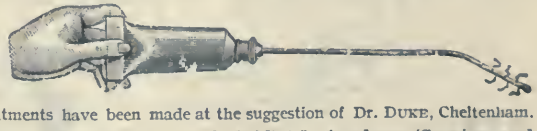
Fig. 3

We Prepare the following Ointments:

1. Boric Acid and Glycerine
2. Cocaine and Morphia
3. Ung. Gallæ c. Opio
4. Hamamelis
5. Do. and Cocaine
6. Ung. Conii
7. Ung. Belladonna
8. Chrysarobin, Iodoform, and Belladonna
9. Gallic Acid and Belladonna
10. Oxide of Zinc and Boric Acid
11. Perchloride of Iron
12. Acetate of Lead and Belladonna
13. Pilewort Ointment

All the above Tubes complete with Pipe, **1/6** each, with the exception of those containing Cocaine and Conium, which are **2/6** each. By post, **3**d. extra.

For DISEASES of the UTERUS.



The Vulcanite Stem and Ointments have been made at the suggestion of Dr. Duke, Cheltenham.

1. Antiseptic (Iodoform)
2. Do. (Boric Acid)
3. Astringent (Tannic Acid)
4. Escharotic (Chlr. of Zinc)
5. Anodyne (Cocaine and Morphia), *useful in Cancer*

Price of Stem, with Ointment Tube of either Nos. 1, 2, 3 or 4 .. each **5s.**
,, ,, ,, No. 5 .. .. .. ,, **6s.**
Spare Collapsible Tubes of Ointment, Nos. 1, 2, 3 and 4 .. ,, **2s.**
,, ,, ,, No. 5 .. .. .. ,, **3s.**

By Post 3D. EXTRA.

N.B.—We will be pleased to supply Tubes filled according to physicians' own formulæ.

R. SUMNER & CO. Ltd. Wholesale and Export Druggists, **LIVERPOOL.**

R. SUMNER & Co. Ltd. LIVERPOOL

Fig. 1.

APRONS, as suggested and worn by Mr. Thelwall Thomas, of Liverpool.

Price 9/- each.

Measurements required—

Circumference at chest, and length desired.

Fig. 1.

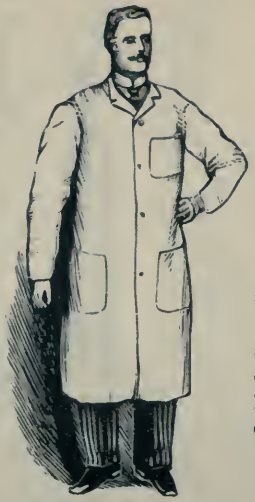


Fig. 2.

COAT, with three pockets.

Price—18/- ea.

Measurements required—

Circumference at chest, length of sleeve, and length of coat desired.

Fig. 2.

Fig. 3.

OVERALLS, with Helmets, for infectious cases.

Price—15/- ea.

Measurements required—

Circumference round neck and chest, length of sleeve, and length of overall desired.

Fig. 3.

Muslinette Aprons and Coats for Surgeons and Accoucheurs, Overalls for Physicians in Attendance on Infectious Cases.

MUSLINETTE is a light waterproof material that can be washed and treated with antiseptics. It is unaffected by a temperature of 212° F., and therefore can easily be rendered aseptic.

"ERYTHEMOL."

(REGISTERED.)

AN ANTISEPTIC SEDATIVE AND DESICCANT OINTMENT, CONSISTING OF A COMBINATION OF SEVERAL SYNTHETIC COAL TAR DERIVATIVES WITH A WOOL FAT AND PETROLEUM BASE.

IN its process of manufacture "ERYTHEMOL" is subjected to continuous milling for a prolonged period, and by this means it is entirely freed from particles and brought to a homogeneous consistency, a property of the highest importance in an ointment.

INDICATIONS.

"ERYTHEMOL" has been used in the treatment of both forms of **Eczema** with most successful results, its strong antiseptic action, combined with its value as a sedative in allaying the irritation, produces marked curative effects in most obstinate cases.

It is also recommended, especially in combination with 2% Cocaine Hydrochloride, for the relief of **Pruritus Ani, Pruritus Vulvæ,** etc.

"ERYTHEMOL" is useful as a dressing in **Minor Operations, Burns, Abrasions,** etc., as it prevents infection and causes rapid granulation.

Acne, Furuncle, and forms of superficial suppuration quickly desiccate under the application of "ERYTHEMOL." **Chronic Ulcers** show considerable improvement by its use.

PRICE 3/6 per lb.

1-oz. pots for Dispensing, labelled—
"The Ointment, to be used as directed," 6/- per dozen.

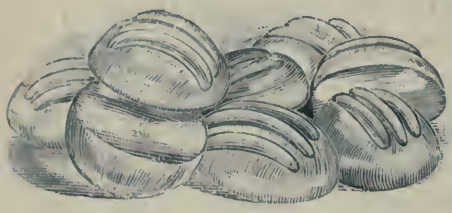
Combined with 2% Cocaine Hydrochloride, 9d. oz.

R. SUMNER & CO., Ltd.,

PHARMACEUTICAL . . . CHEMISTS, . . . LIVERPOOL.

PASTILLES

GLYCERIN HEROIN COMP.



COMPOSITION.

Ammonium Hypophosphite,
Prunus Virginiana,
Hyoscyamus Niger,
Pinus Strobus,
Tolu,
Glycerine,

And Heroin Hydrochlor. 1/120th grain in each Pastille.

This combination has proved of the greatest value in pulmonary affections. Heroin Hydrochlor. possesses a more pronounced sedative effect on the organs of respiration than even Morphine or Codeine, and is certainly less dangerous.

There is a small quantity of Liquid Extract of Hyoscyamus present, ¼ minim in each Pastille; this acts as a local analgesic. The Virginian Prune and Ammonium Hypophosphite are powerful expectorants, whilst the balsamic properties of the Pinus Strobus and Tolu are soothing and antiseptic to inflamed mucous surface.

In the form of a Pastille, these drugs are especially efficacious in Cough and Bronchial Affections, and can be particularly recommended to check the exhausting cough of Phthisis. They have the advantage over the liquid preparation as they dissolve slowly in the mouth, and so, being kept in contact with the mucous membrane, their beneficial action is considerably prolonged.

DOSE OF THE PASTILLE.—One or two every hour until the sedative effect is obtained.

PRICE - - - - - **4/-** per lb.

R. SUMNER & CO., Ltd.

Wholesale Druggists,

LIVERPOOL.

ECSŌLENT COMPOUND

For Eczema, Erythema & Skin Affections.

ECSŌLENT COMPOUND is a non-staining emollient Preparation. It is a perfect germicide, disinfectant and antiseptic. The Compound is non-poisonous, and is free from glycerine and all animal fat. It possesses remarkable potential antiphlogistic, antipruritic, and analgesic properties, & promotes healthy nutrition of the skin.

FELLOW OF THE ROYAL SOCIETY M.D. (London), writes:

"The medicaments incorporated in the Compound are of therapeutic value, and I am of opinion that the Soap and Compound should prove of great value in the treatment of Eczema and skin troubles."

ECSŌLENT SOAP is medicated with Coal Tar and germicidal products.

ECSŌLENT POWDER is a perfect antiseptic, deodorant, and absorbent.

SAMPLES SENT FREE

To the Medical Profession in the United Kingdom.

SIGN THIS FORM

FOR FREE SAMPLES

And send to Ecsōlent Compounds, Ltd.

Dr......

Address.....

Med. Ann. 1910

ECSŌLENT COMPOUNDS Ltd.

Saracen Buildings, LONDON, E.C.

MARTINDALE'S
NEW PREPARATIONS

(Duly described in the EXTRA PHARMACOPŒIA, Edn. XIII.)

"ARSAMIN"
(New Organic Arsenic Preparation).

RADIUM APPLICATORS

"MARRUBIN"
(Red Bone Marrow Preparation.)

"SEDEFF"
(Effervescent in Sickness).

"METHYSAL" BALM
(*EXTRA PHARM.*)
For Treatment of Rheumatic Affections).

"SOLUBES"
(Compressed Chemicals for Solutions.)

"STERULES" (Sterile Capsules for Hypodermic and Ophthalmic work.)

EFFERVESCENTS.

SODIO-MAGNESIAN APERIENT,
Original Bottles, 8 oz. fl. capacity, retailing at 1/6; 16 oz. 2/6; 32 oz. 3/6

CHLORO-SODIO-MAGNESIAN APERIENT,
(*Prices as above*).

SODIO-MAGNESIAN APERIENT with CAFFEINE (Martindale).
A useful combination.
Original Bottles, 8 oz. fl. capacity, retailing at 2/-; 16 oz. 3/-; 32 oz. 5/6

GLYCEROPHOSPH. CO,
Original Bottles, 8 oz. fl. capacity, each 2/6

TRILACTINE TABLETS.

(*EXTRA PHARM. XIII., p. 845.*)

Lactic Acid Bacilli for the Metchnikoff Treatment of Guaranteed Efficiency.—Original Boxes of 8 Tubes 4/6

TRILACTINE OUTFIT.

Guaranteed for preparing Curdled Milk with above Tablets.

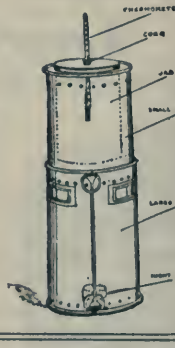
With Pint Jar, Post Free in Great Britain, 11/6.
With Quart Jar in addition, post free in Great Britain, 14/-

Brochure on Lactic Acid Bacilli Treatment, by W. H. MARTINDALE, Ph.D., post free on application.

WIMPOLE INSTITUTE VACCINES—Sole Agency.

Full Price List on application.

TRILACTINE OUTFIT.



W. MARTINDALE

Manufacturing Chemist,

10 New Cavendish St., LONDON, W.

Telegrams: "Martindale, Chemist, London."

Riedel's Specialities

APERITOL Phenolphthalein Aceto-Valerianate. Mild, non-griping Purgative and Laxative. Excellent in habitual Constipation. In Tablets and Bonbons. **Dose: 3 to 6 grains.**

BORNYVAL Borneol Valerianate. Standardised Sedative Principle of Valerian. In Hysteria and general Neurasthenia. Bornyval Pearls. **Dose: 4 to 12 minims.** *See Medical Annual, 1909, p. 14.*

GONOSAN Active Principle of Kava-Kava in purest East Indian Sandalwood Oil. Best Balsam for Internal Treatment of Gonorrhœa. Gelatine Capsules. **Dose: 5 to 10 minims.**

MERGAL Mercury Cholate. Safest Mercurial for prolonged Administration in Syphilis. Well tolerated. Contains 23·3 per cent Mercury. Capsules. **Dose: ¾ to 1½ grains.** *See Medical Annual, 1909, p. 557.*

OVOGAL Albumen Cholate. Cholagogue in acute and chronic Catarrh of Liver, Cholelithiasis, Fatty Stools, Intestinal Dyspepsia, Atonic Constipation. Gelatine Capsules. **Dose: 7½ to 22 grs.**

SALIPYRIN The original Salicylate of Antipyrin. Over 18 years' Reputation. Invaluable in Influenza, Colds, and Rheumatic Affections. Powder and SALIPYRETS, 5 and 15 grains.

SCOPO-MORPHINE Physiologically pure Morphine-Scopolamine. For general and spinal Anæsthesia. Injections in Labour. Sterilised ampullæ (1 and 2 c.c.). *See Medical Annual, 1909, p. 265.*

THIOL Non-irritant cutaneous Disinfectant for Burns, Eczema, and Skin Diseases. Sulphur Preparation, soluble in water. Does not stain linen. Administered in Gout and Rheumatism.

A 20-page booklet "RIEDEL'S SPECIAL PREPARATIONS" is sent to every Medical Man upon receipt of professional card.

Samples and Literature willingly supplied to the Medical Profession

The J. D. RIEDEL CO.,
54, Cannon St., LONDON, E.C.

MUCUS . . EVACUATOR,

Suggested by

W. C. MAYO,

M.R.C.S., L.R.C.P.

The above is a sketch of a small apparatus which I have designed for the purpose of extracting (by suction) mucus and saliva from the pharynx and air passages when administering anæsthetics.

It consists of a plated metal tube with a short curve, having a flattened bulbous end with tapering holes, attached to a suction syringe with glass insertion. At the opposite end is a small metal receptacle fitted with a swivel mount to prevent spilling, the bottom of which is detachable.

I have found this instrument most useful. It is quite easy to use and can be sterilized by boiling. It is a great improvement on the old method of using a gag and sponge on holder to clear the pharynx.

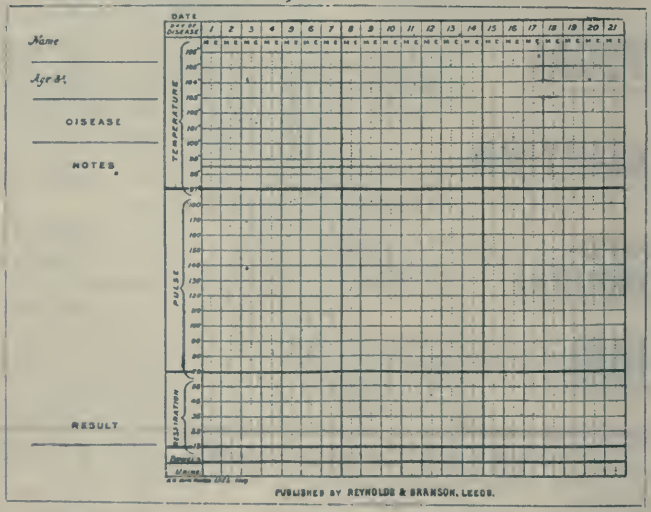
The apparatus has been most skilfully made for me by REYNOLDS & BRANSON, LTD., of Leeds. WALTER C. MAYO, M.R.C.S., L.R.C.P.

Price complete ... **10/6** each.

CLINICAL CHART,

Suggested by

A. W. MAYO ROBSON, D.Sc., F.R.C.S.



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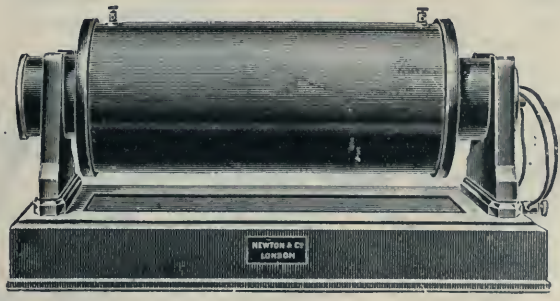

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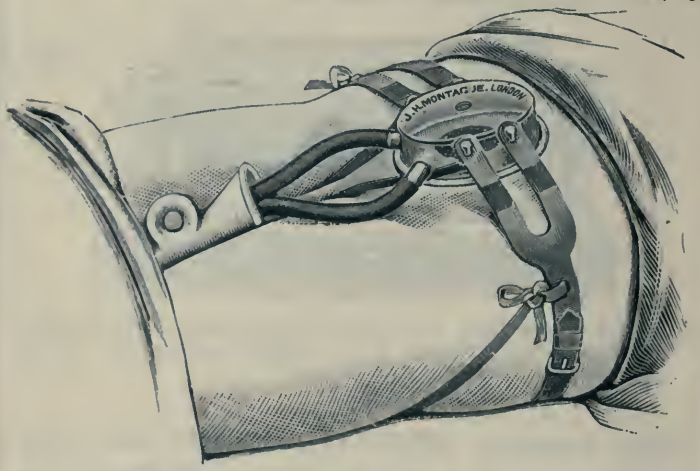

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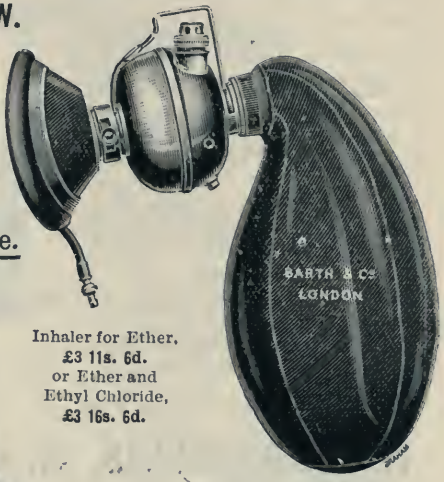

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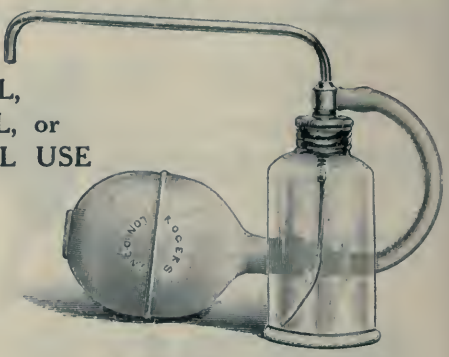

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Chloride of Calcium	2·93
Chloride of Magnesium	10·10
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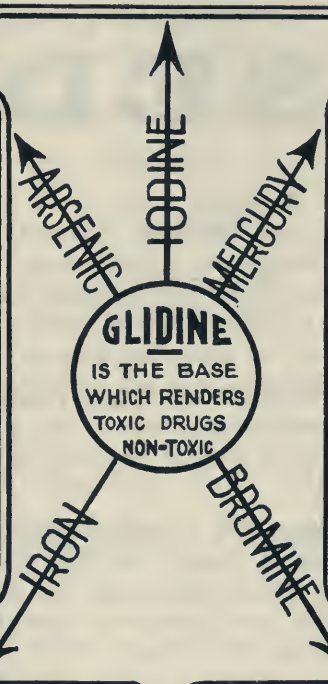

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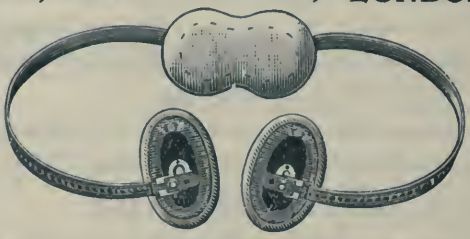

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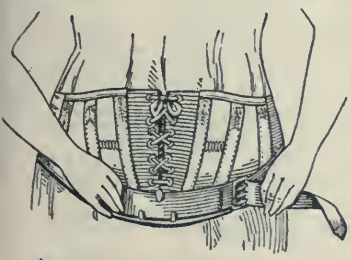

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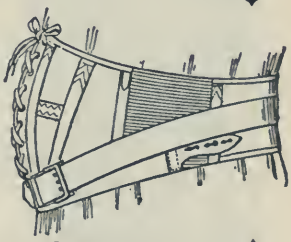

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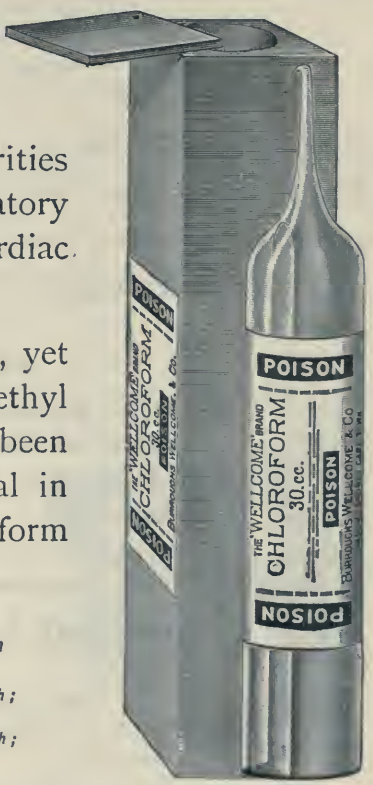

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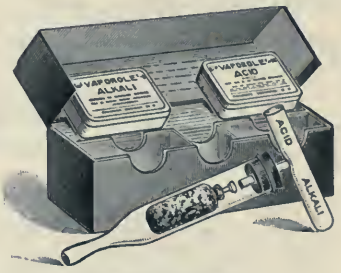

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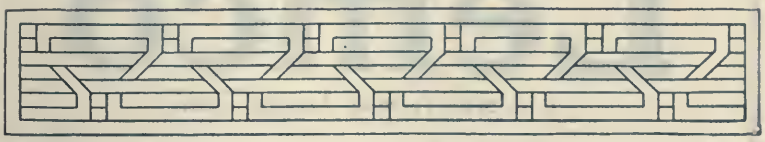

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PREFACE

During the preparation of our twenty-eighth issue, we have been much impressed by the large amount of careful and detailed work which has been done in almost every department of medical knowledge. This makes the work of condensation more difficult, but renders the necessity for such a volume greater.

The subject of Therapeutics, which languished almost to extinction some years ago, is now becoming an ever-widening field of study. Formerly we discussed the "action" of drugs, now we speak of the "effects" of drugs and the "action" of the organism. The source of energy has been transferred. All the new therapeutic methods have for their object the cultivation of vital energy or its direction against particular toxic agents created from within or admitted from without.

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The advances in Surgery, both as regards technique and accurate diagnosis, have occupied much of our space, but we hope they will help many of our readers when faced by the difficult problems presented. The amount of careful research which has been made on the subjects of typhoid fever, cancer, and syphilis, appears to warrant the space we have given to these subjects.

Some of our kindly reviewers, whose encouragement has been a real stimulus to our efforts during the past twenty-eight years, speak of the "catholic nature" of our editorial staff, and the impartiality of our reviews. This has always been our ideal, and we are grateful for its recognition.

Should any writer feel that a contribution of importance has been overlooked, he will help us by enabling us to rectify the mistake.

We are always glad to hear from subscribers respecting any subject concerning which they need more information. The article on "Urinary Deposits" in the present volume is the outcome of such a suggestion.

THE EDITOR.

The "Medical Annual" Offices,
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THE MEDICAL ANNUAL

Part I.—The Dictionary of Materia Medica and Therapeutics

REVIEW OF THERAPEUTIC PROGRESS, 1909,

BY

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GENERAL REVIEW

Very little of importance falls to be noted in the period under review. The output of new drugs is falling off, and nothing of very great interest has been brought forward. The manufacturers are still working along the old lines; accordingly we have received some new organic iodine and salicyl compounds. It is very doubtful, however, whether the drawbacks, which the manufacturers assert attend the use of the alkali iodides and salicylates, occur frequently enough or are sufficiently pronounced to warrant the statement that these new organic compounds are of practical importance.

An interesting but rather humiliating example of the danger of rule-of-thumb dosage, is the discovery that the ordinary hypodermic tablets of digitalin contain too little of the drug to produce any action on the circulation. Yet they have been used by the medical profession for many years.

In organotherapy we note the abandonment of the trypsin treatment of cancer; but a new claim springs up in the treatment of tuberculous abscesses. The relation of the parathyroid glands to tetany continues to interest investigators.

There has been very little work done in connection with the therapeutic use of sera. It seems pretty clear that with the exception of antidiphtheritic serum none of the commercial sera are of much value. With the introduction of vaccine treatment into general use in this country, interest in serum-therapy has steadily diminished, and now that vaccines are being introduced into Germany, the same decline seems to be taking place there.

DICTIONARY OF REMEDIES.

ADRENALIN.

As the results of comparative experiments on the eye with synthetic suprarenin and adrenalin preparations obtained by extraction of the suprarenal glands, Kraupa[1] comes to the conclusion that the synthetic preparation is in every respect equal in action to the others, while it is cheaper. It can be boiled for three minutes without undergoing any change. Exposure to the air for eight days somewhat darkens the colour of the solution but does not impair its activity.

Since Bossi, in 1907, recommended adrenalin in **Osteomalacia,** it has been tested in this disease by a number of observers. The results obtained are not uniform. Revaudi[2] records a case successfully treated with adrenalin injections in 1906, which remained well since then and has, in the meantime, had one miscarriage and has borne a full-time child without any return of the osteomalacic symptoms, though she has received no further treatment since she left the hospital in February, 1907. On the other hand, Engländer[3] has recently had an opportunity of testing the value of adrenalin in a series of five cases of osteomalacia, and has come to the conclusion that it is of no particular value, and is no improvement on the older method of treatment with phosphorus. He used the 1–1000 preparation of Parke, Davis & Co., starting with initial doses of 0·5 cc., which were gradually increased to 1 cc. The drug was injected into the abdominal subcutaneous tissue. It proved rather painful, but produced no local reaction. On the other hand, severe constitutional symptoms were not uncommon at the commencement, but all the patients by degrees became more tolerant of the drug. His patients all gradually improved, but this he ascribes in large part to the better hygienic conditions during their stay in hospital. No definite effect of the adrenalin treatment was detectable in the lumbar pain or bone tenderness.

Crile[4] recommends the injection or infusion of adrenalin centripetally directly into an artery in cases of severe **Shock,** e.g., chloroform anæsthesia. The introduction of the drug into a vein has the objection that the vein does not contract well, and the drug, before reaching the coronary arteries, must pass through the lungs and right and left heart.

In anæsthetized animals the intravenous injection of adrenalin is followed by a transitory increase of urine, but according to Houghton and Merrill,[5] this depends chiefly on the increase of blood-pressure rather than a specific action on the secreting cells of the kidneys.

REFERENCES.—[1]*Med. Klin.* Sept. 6, 1908, in *Brit. Med. Jour.* Feb. 20, 1909; [2]*Gaz. deg. Osped.* Nov. 15, 1908, in *Brit. Med. Jour.* Feb. 6, 1909; [3]*Centr. f. Gyn.* Mar. 27, 1909; [4]*Amer. Jour. Med. Sci.* Apr. 1909; [5]*Jour. Amer. Med. Assoc.* Nov. 28, 1908.

AGARICUS ALBUS.

Wallace[1] recommends the use of a tincture of agaricus albus for the **Arrest of the Mammary Secretion.** He gives it in the form of a tincture in doses of from 30 to 40 min. in water, thrice daily. The arrest is brought about gradually without any unpleasant symptoms or local disturbances, and without any local treatment. In cases in which the secretion has already become well established, there occurs a steady diminution in the amount of milk until, in the course of a few days, the breasts have become soft and flaccid, and secretion is practically at an end. At the same time the skin generally becomes dry, particularly that portion adjacent to the mamma and in the axillary region. In cases of still-birth, the drug has been commenced on the day following delivery. Sometimes no secretion of milk has occurred; in other instances small quantities of fluid ooze through the nipples for two or three days, the secretion then quietly disappearing. Bandaging has been found unnecessary, and is no longer used. He has had no experience with the drug in galactorrhœa, and there is the possibility that it might affect the child.

REFERENCE.—[1]*Med. Press*, Feb. 17, 1909.

ALCOHOL.

In an interesting paper on the remedial use of alcohol, Macdonald[1] points out that alcohol is a drug, and as such should be administered with the same precision and discrimination as in prescribing other powerful drugs. Given with these precautions, it is an invaluable remedy in the treatment of disease. The physiological data for its use are the widening of the blood channels, with increased flow of blood to the brain and other organs, with a diminished peripheral resistance and a temporary increase in the activity of the circulation. At the same time it has a certain value as food and a lethargic action on the brain. In the eruptive and continued fevers it is commonly agreed that young children, under normal conditions, require no alcohol or other drug, but in the presence of **Deglutition Pneumonia,** and in **Septic Conditions** generally, the use of alcohol has proved of service. In **Diphtheria,** alcohol is useful as an aid to strychnine in the sudden attacks of syncope which occur. In repeated **Vomiting,** especially if associated with a septic state and a quick intermittent pulse, iced brandy is sometimes retained by the stomach when peptonized food and nutrient enemata have failed, and the patients may be nourished in this way for several days. In **Typhoid Fever,** in mild uncomplicated cases no alcohol is required, but in other cases with a frequent, low-tension pulse with dicrotism, a sustained high temperature with muttering delirium, marked tremor, and septic conditions, it is found that these symptoms are relieved by the administration of alcohol. He does not agree that the mere history of previous alcoholic excess is necessarily an indication for the immediate administration of alcohol. In **Typhus Fever** the benumbing influence of alcohol is utilized with benefit in the sleepless-

ness and delirium. On the other hand, he finds alcohol contra-indicated in acute forms of renal disease, and it is best withheld in neurotic conditions associated with feelings of depression. In whatever form the alcohol is administered, it must be given in definite dosage, 6 to 9 oz. being a reasonable daily range for an adult, and as soon as the object for which it was given is attained, the alcohol should be withdrawn.

Ermonet[2] recommends alcoholic compresses in the treatment of painful **Gastric** or **Intestinal Spasms.**

Becker[3] approaches the question of the deleterious action of alcohol from quite a new side. He has investigated the quantity of alcohol consumed daily by a series of 41 people, who have lived over 89 years. He considers that with such examples of longevity it is impossible to hold that alcohol was deleterious or caused shortening of life. The 41 individuals consisted of 20 men and 21 women drawn from all classes of society. It was found that the average consumption was 14·86 grams of alcohol daily. He considers, therefore, that we may safely admit that 15 grams of alcohol is a safe daily dose, which will not shorten life, and that half this quantity can be taken as a single dose.

REFERENCES.—[1]*Brit. Med. Jour.* Jan. 30, 1909; [2]*Jour. d. Pratic.* in *Il Policl.* Dec. 20, 1908; [3]*Ther. Monats.* 1908, Hft. 9.

ALLOPHANIC ACID.

According to Overlach,[1] this substance seems likely to prove of value in pharmacy. Pure allophanic acid is converted into urea and CO_2, both of which are without any marked effect upon the body. The acid forms many chemical compounds, and in doing so has the following properties. If it combines with fluid substances it forms solid compounds. The compounds are mostly tasteless. Similarly, unpleasant odour is reduced to a minimum. Examples of these actions are seen in the allophanic acid esters of guaiacol, santalol, and castor oil. Lastly, many easily decomposed bodies form fairly stable compounds with allophanic acid. As a rule the allophanic compounds liberate the allophanic acid in alkaline media.

REFERENCE.—[1]*Berl. klin. Woch.* 1908, No. 30.

ALMATEIN.

Almatein ($C_{36}H_{32}O_{14}$) is a new synthetic intestinal astringent preparation which, according to Tennenbaum,[1] possesses valuable antiseptic properties. It is prepared by the action of formaldehyde on hæmatoxylin, and forms a brick-red, fine powder, insoluble in water or acids, but readily soluble in alkaline media and in the alkaline intestinal contents. It is without taste or odour, and is easily administered. He has used it during eighteen months in fifty cases of acute and chronic cases of **Intestinal Catarrh.** He used doses of from 2 to 6 grams per diem in tablets, powders, capsules, or suspension, without ever noticing any signs of toxic action or irritation of the bowel. His usual procedure was to clear out the

bowels with a gentle purge, put the patient on a bland diet, and administer 0·5 to 1 gram almatein every two or four hours. The number of the evacuations soon becomes less, the consistence of the stools becomes firmer, the foul smell due to fermentation disappears, and the painful peristalsis ceases. The stools are coloured red, which to some extent enables one to form an opinion of the location of the catarrhal disturbance. If after administration of almatein several colourless stools are passed, he concludes that the catarrh is low down in the intestine, while the immediate passage of coloured stools indicates catarrh of the upper intestinal tract. Almatein is also serviceable in **Tuberculosis of the Intestine.** The drug has also recently been advocated by Venus[2] and Werndorff[3] as an **Antiseptic Dusting Powder** which tends to expedite the healing of wounds.

REFERENCES.—[1]*Cent. f. inn. Med.* 1909, No. 13; [2]*Centr. f. Chir.* 1908, No. 17; [3]*Münch. med. Woch.* 1909, No. 3.

AMYL NITRITE.

Rzentkowski[1] has used amyl nitrite extensively in various conditions. He finds it quite a safe remedy, and pleads for a more extended use of it. In healthy men, amyl nitrite has very little effect upon the peripheral blood-pressure. In healthy men without any vascular abnormality, the fall of pressure produced by the inhalation of amyl nitrite amounts only to about 3 to 9 per cent as measured in the brachial artery. In abnormally high vascular tension in arterio-sclerotic conditions, a much more marked fall is induced in the diastolic blood-pressure, which seems to point to the conclusion that in such cases the increased tension is very largely due to a muscular contraction of the vessel wall. The same thing is seen when such patients become subjected to acute febrile attacks. In such cases the pressure is reduced, and the pulse may become much softer and more dicrotic under the influence of the toxin. He calculates that the heart does more work under the influence of amyl nitrite than in normal conditions. Hence, fall of pressure is not due to weakening of heart. In healthy, elastic vessels, after stopping amyl nitrite, the blood-pressure almost immediately returns to normal again, but in arteriosclerotic conditions the fall of blood-pressure is more prolonged, and may remain evident for a quarter of an hour. He thinks that the difference in effect of drugs in health and arteriosclerosis is due to the fact that in arterio-sclerosis the abdominal vessels have lost their power of compensatory contraction, which in health serves to counteract the fall produced by peripheral dilatation.

REFERENCE.—[1]*Zeit. klin. Med.* Bd. lxviii., Hft. 1 & 2.

ANTIFORMIN.

Klebs[1] found this preparation of great value in various conditions of the skin, such as **Pruritus, Eczema, Thickenings of the Cutaneous Tissue** subsequent to eczema and varicose veins, **Hæmorrhoidal Thickenings,** etc. He holds that in these varied conditions the *Diplococcus semilunaris* (*catarrhalis* of Pfeiffer) plays a not unimportant part.

Himself a sufferer from pruritus senilis, he found great relief from the local application of a 10 per cent solution of antiformin. He simply washes the part with a piece of flannel soaked in the solution and allows the fluid to dry. In this way he obtains almost immediate relief. In hæmorrhoidal thickenings of many years standing, and in a diffuse thickening of the skin of the leg which followed a thrombosis of the femoral vein over thirty years ago, the effect of the antiformin solution was astonishing. The hæmorrhoids disappeared, and the skin of the leg gradually became normal. He thinks this is due to the drug killing off the organisms in the skin. He also makes the suggestion that in similar dilution the drug may prove useful in the treatment of **Alopecia,** and for disinfecting or surgically sterilizing the hands.

This disinfectant has been further investigated by Uhlenhuth and Xylander.[2] They find that it has marked power of penetrating and dissolving organic substances, e.g., keratin, chitin, skin, hairs, insect bodies, wool, etc. It dissolves bacteria and protozoa, except acid-fast bacteria, as tubercle and lepra bacilli. It does not appear to destroy the spores of anthrax. It destroys most bacterial and animal toxins, e.g., paratyphoid, dysentery, Gaertner, diphtheria, and tetanus toxins and snake venom. It has a marked deodorant action, but this is somewhat lessened by the presence of albumin. They recommend antiformin for this marked solvent power as a disinfectant for stools, urine, and sputa. They also draw attention to the action previously noted with regard to phthisical sputa. The mucus is dissolved, all bacilli except the tubercle bacilli are destroyed, and the sputum is liquefied. This permits of centrifuging, which markedly facilitates the detection of tubercle bacilli.

Geilinger[3] refers to this solvent action on tuberculous sputa. The undiluted antiformin quickly liquefies the sputum, but does not kill the tubercle bacilli. A 25 per cent solution requires about seventy-two hours for complete liquefaction of the sputum. He has found the best solution for liquefying the sputa to be a mixture of equal parts of 5 per cent KOH and 5 per cent (by volume) H_2O_2.

Reference.—[1]*Berl. klin. Woch.* July 19, 1909; [2]*Ibid.*; [3]*Arbeit. a. d. Kaiser. Gesundheits.* July, 1909; [4]*Arch. f. Hyg.* 1909, Vol. lxxi. Hft. 1.

ANTIPYRIN.

This drug has been advocated internally in the treatment of **Whooping-cough,** but according to Fendlen[1] it is more efficacious in the early stages if it is given as an intralaryngeal injection. Ten drops of a 2 per cent solution are injected, next day 12 drops, and on the third day 15 drops. These amounts in older children can be increased to 20 or even 25 drops without ill effects. The immediate result is that the paroxysms cease for several hours, and reappear in a much less severe form and at less frequent intervals.

Reference.—[1]*Amer. Jour. Obst.* June, 1908.

ANTIRABIC SERUM. (*See* Serum-therapy.)

ANTISTREPTOCOCCIC SERUM. (*See* SERUM-THERAPY.)

ANTITHYROIDIN.

Erben[1] reports a case of diabetes in which the administration of antithyroidin had a favourable influence in diminishing the urine and sugar. He gave for the first fourteen days twice daily from 5 to 10 drops, and in the next fourteen days raised the dose to 15 drops twice daily.

REFERENCES.—[1]*Prag. med. Woch.* 1908, No. 34.

APOMORPHINE.

According to Douglas,[1] apomorphine is a valuable **Hypnotic,** prompt, safe, and sure in its action. The dose necessary to produce this hypnotic effect is much smaller than that necessary to induce emesis. He puts it at about $\frac{1}{30}$ gr., given hypodermically. The individual susceptibility varies somewhat, but it is found that the hypnotic dose is always less than the emetic dose. If it is desired to avoid nausea, the quantity must be as near the emetic dose as possible without quite reaching it. If only a little too small, no effect at all is produced, even if repeated every thirty minutes; it is therefore evidently not cumulative in action.

REFERENCE.—[1]*Ther. Gaz.* June 15, 1909.

ARSACETIN.

This is stated to be four times less toxic than atoxyl, and accordingly has to a large extent replaced atoxyl, as less likely to produce toxic symptoms. A case of optic atrophy reported by Ruete[1] shows that even with arsacetin the danger of serious toxic manifestations is by no means slight. His patient, a man aged 72, suffered from psoriasis. He had previously been treated with injections of sod. arsenate and has borne arsenic well. Thus in 1906 he received 48 injections = 466 mgrams, and towards the end of 1907 he received 18 injections = 88 mgrams of sod. arsen. On the last occasion he entered hospital in February, 1909, with a return of the psoriasis. Apart from some bronchitis and slight atheroma he was otherwise in good health. The reflexes were normal, and the urine was free from sugar or albumin. He was treated with arsacetin, receiving on February 3, 1909, an injection of 0·6 gram, which was followed by slight œdema of the prepuce, which had passed off by the following day. On the 5th, 10th, and 11th he received injections of 0·6 gram, which caused no discomfort. The next two injections, on the 17th and 18th, were followed by intestinal pain and diarrhœa. Arsacetin was therefore stopped and opium was ordered. On the 28th he complained that his sight was dim. The visual acuity of R. was $\frac{1}{3}$, L $\frac{1}{6}$, papilla pale, arteries constricted. Visual field very constricted, both for white and colours. Four days later the condition had become worse: R.V.A. $\frac{1}{6}$–$\frac{1}{3}$, visual field more constricted, colours only detected with central vision; L.V.A. $\frac{1}{200}$, could only count fingers 1 foot off. Colours not recognized. In this case, therefore, after 3·6 grams of arsacetin severe optic atrophy appeared.

REFERENCE.—[1]*Münch. med. Woch.* Apr. 6, 1909.

ASFERRYL.

Asferryl is a compound inorganic preparation of iron and arsenic. It is a greenish-yellow powder, which dissolves with difficulty in water and weak acid, but is readily soluble in weak alkalies. Though it contains 23 per cent of arsenic and 18 per cent of iron, it is said to be about ten times less toxic than arsenious acid. It is put up in tablets, each containing 0·04 gram asferryl, equivalent to 0·01 gram arsenic. Owing to the low toxicity of the preparation, it is possible to introduce large quantities of arsenic without producing any poisoning. The maximum daily dose appears to be about 2 tablets. It is a good plan to commence with ½ tablet twice daily, and after four or five days raise the dose to ½ tablet thrice daily, which after another four or five days may be further increased to 1 tablet twice daily. The same procedure is then adopted for diminishing the dose to ½ tablet twice daily, and this may then be gradually increased as described. With this dosage no trouble was experienced, but larger ones are liable to cause gastro-intestinal disturbance. Fries[1] has used asferryl in a series of 25 cases of **Anæmia** of various types, and finds that it produces a very satisfactory increase in the hæmoglobin and number of erythrocytes, while the weight increases. In his series he found an average weekly gain of 4·4 per cent hæmoglobin and 0·6 kilo. in weight, whereas in a similar series of 25 cases treated with ordinary simple preparation of iron, the corresponding gains were 3·7 per cent and 0·4 kilo. respectively.

REFERENCE.—[1]*Ther. d. Gegenw.* Aug. 1909.

ASPIRIN.

Bulloch[1] records a peculiar idiosyncrasy to aspirin. The patient, a man, aged 48, took a single powder containing 10 gr. Within a quarter of an hour, he was seized with violent itching all over the body, chiefly affecting the head. The skin felt burning hot and became tight from intense œdema. The tongue and eyelids were also much swollen. There was a sense of great oppression round the throat and over the chest, a feeling as if dying of suffocation, and he was unable to speak. Within twenty minutes the condition began to improve, perspiration commenced, the sensation of impending death disappeared, and the œdema rapidly diminished; but intense thumping of the heart continued for several hours and prevented sleep. The patient was subject to urticaria and asthma. The aspirin seemed perfectly good, and another powder obtained at the same time produced no ill effect in another person.

REFERENCE.—[1]*Hosp.* July 17, 1909.

ATOXYL.

It is well known that though atoxyl is actively trypanocidal after injection into the body of infected animals, in test-tube experiments it possesses very little, if any, deleterious action on the causal organisms. Thus trypanosomes are apparently not at all affected

when placed in strong solutions (1–50) of atoxyl. Ehrlich[1] explains this discrepancy by supposing that the body tissues cause some reduction products of atoxyl to be formed, and that the active trypanocidal action is due to such reduction products. By the action of weak reducing agents, as sulphurous acid, paramidophenylarsenoxide is readily formed. This substance in test-tube experiments is commonly more actively trypanocidal than atoxyl. Whereas it requires a solution of 1–20 to produce any action at all upon trypanosomes, the paramidoarsenoxide in solution of 1–100,000 kills the trypanosomes immediately, while 1–500,000 kills them in three minutes. He has also found that the atoxyl-resisting strains of trypanosomes are less easily affected by paramidophenylarsenoxide. Ehrlich explains the therapeutic activity of atoxyl by supposing that the trypanosomes possess an "arsenoceptor" or "arsenoreceptor" element which is enabled to combine with the arsenic compounds and thus bring the arsenic into active combination with the trypanosomes. Atoxyl-resistant strains are due to the fact, that in such strains the avidity of such arsenoceptors is much reduced; consequently the arsenic is not brought into therapeutically active combination with the trypanosomes, but in arsenophenylglycin Ehrlich has discovered a substance which kills even atoxyl-immune strains of trypanosomes.

Against this theory of Ehrlich's some criticism has been advanced by Levaditi.[2] He thinks that the reduction products do not act as such, but first enter into combination with proteid matter and act as an arseniated toxalbumin. He claims to have obtained such a toxalbumin by allowing liver tissue to act upon atoxyl. Precipitation with alcohol gives an albuminous arsenic compound free from atoxyl, which kills the trypanosomes in test-tube experiments. Ehrlich's simple explanation seems the more likely one. Roehl[3] pointed out that Levaditi's toxalbumin is much less active than paramidophenylarsenoxide. The former in 1–1000 solutions (reckoned for atoxyl) only kills trypanosomes after ten minutes' contact, whereas the latter immediately kills them in a solution of 1–100,000, and even in the presence of an emulsion of liver affects them rapidly in solution of 1–20,000.

Igersheimer and Rothmann,[4] however, do not quite agree with Ehrlich's view that atoxyl is converted into paramidophenylarsenoxide. They carried out experiments on man, cats, dogs, and rabbits. They find that elimination is rapid, being completed in man in nine hours. The drug is eliminated in the urine as atoxyl, and no paramidophenylarsenoxide is obtained. In a rabbit, 96 per cent of the atoxyl injected was recovered in the urine, but as the urine generally contained more arsenic than could be accounted for by the atoxyl present, some chemical change must have taken place. In rabbits, after intravenous injection, the atoxyl is found almost entirely in the serum, and only in very minute traces in the corpuscles. It apparently remains longer in the serum than inorganic preparations do, which

may explain its activity against trypanosomes, whereas the fact that it does not penetrate the corpuscles may be the cause of the poor action in malaria. There must be some production of an inorganic compound of arsenic, but only in a relatively non-toxic form. After injections of atoxyl they find traces in the eyes of cats and dogs, which do not occur after injection of inorganic arsenic preparations.

The physiological action of atoxyl on animals has been studied by Cianni[5]. He finds that it is better employed in a 10 per cent than in a 20 per cent solution, to prevent precipitation. Medium doses cause an increase in the body weight, which continues after the drug is stopped. With toxic doses the animals lose weight. Moderate doses increase the hæmoglobin and also the number of the blood cells. With moderate doses no hæmolysis is seen, but it occurs after toxic doses. The heart is somewhat slowed and the blood-pressure rises; after toxic doses it falls, though the respiration is not affected; but such doses reduce the muscular activity. The toxic dose is 0·4 gram per kilogram of body weight for subcutaneous use, and 0·2 gram for intravenous application, and produces severe parenchymatous inflammation and hæmorrhage in the organs.

Schacht[6] has systematically employed atoxyl during five years as a tonic with excellent results and no harmful secondary effects. He uses intramuscular injections into the gluteal region, followed by light massage. He finds atoxyl a successful substitute in all conditions in which arsenic is usually given, as **Anæmia, Tuberculosis, Convalescence** after infectious disease, and **Exophthalmic Goitre.** Increase in weight, red corpuscles, and hæmoglobin follows. In a course of tonic treatment he uses single doses, as follows, 0·02; 0·04; 0·06; 0·10; 0·12; 0·15; 0·15; 0·15; 0·15; 0·12; 0·10; 0·08; 0·06; 0·04; 0·02 gram, in all 1½ gram, and these doses he believes can be given safely.

Igersheimer[7] has investigated the pathology of *atoxyl amblyopia*. He applied the drug directly to the eyes of animals. Introduced into the anterior chamber, it produces no permanent lesions, but 1 mgram introduced into the vitreous produces a violent reaction. Though $\frac{1}{10}$ mgram causes no macroscopic changes in the vitreous, it eventually produces degeneration of the nerve cells and optic nerve. In the cat, subcutaneous injections of atoxyl produce lethargic movements, tetanic spasms, ataxy, conjunctivitis, and lesions of the ganglion cells and optic nerve; but he could not determine whether the optic nerve changes were primary, or secondary to more intense central lesions.

Knopf and Fabian[8] have used atoxyl injections in a variety of morbid conditions in which arsenic administered in other ways either could not be tolerated or produced no benefit. In two cases of **Chorea Minor** the injection of atoxyl produced an apparently permanent cure, but in a third case had no curative effect. A case of **Banti's Disease** and one of **Pernicious Anæmia** steadily improved under atoxyl treatment, but in malignant tumours the effect of the

treatment was not marked. In syphilitic cases the results were interesting. In a case of **Hepatic Syphilis** under KI no change took place, but under atoxyl treatment (commencing with 0·1 gram every second day, gradually increased to 0·2 gram, in all 14·4 grams from Aug. 27 to Oct. 16), the ascites disappeared, the liver diminished in size, and Wassermann's serum reaction became negative. Four months later there was again a slight enlargement of the liver, and the serum reaction had become positive. Under a renewed course of atoxyl the liver became smaller, but there was no change in the serum reaction. A case of **Secondary Syphilitic Disease of the Throat** cleared up very rapidly under atoxyl injections of 0·2 gram every second day. In one of their tumour cases there developed well-marked optic atrophy. The patient, sixty-two years of age, was suffering from a tumour (struma ?) behind the sternum, causing marked dyspnœa and other pressure symptoms. The tumour was non-pulsatile, and Wassermann's reaction was negative. In the last week of April atoxyl was begun, at first every second day in doses of 0·1 gram, but after a week this was raised to 0·2 gram every second day. In all, 6·3 grams were given in 66 days. The injections were painful. Early in June the patient complained of feeling of weight in his limbs. In the middle of June he suddenly became aware of a fluttering sensation in the eyes, but ophthalmoscopic examination did not detect any abnormality. Gradually, however, double optic atrophy developed, with marked constriction of the visual field. In view of this case they recommend that atoxyl should only be used as a substitute for other remedies when these cannot be taken or fail to act. During an atoxyl cure it is essential that the eyes should be regularly examined, with special reference to limitation of the visual field.

A considerable number of cases are now on record in which the use of atoxyl has been followed by toxic symptoms, but hitherto the most serious form has been optic atrophy with consecutive blindness. Schlecht[9] had an even more unpleasant experience, as his patient died. He states that this is the first recorded fatal case of atoxyl poisoning. His patient was a man aged 29, suffering from secondary syphilis. He was given KI internally, and on the 6th, 9th, 12th, and 15th of December received subcutaneous injections of 0·1 gram of salicylate of mercury. On the 21st, 24th, 26th, and 28th of December 0·6 gram of atoxyl was injected subcutaneously. On the 28th he began to be ill, with at first only slight fever. Next day he vomited in the forenoon, and in the afternoon suddenly went off in an epileptiform attack, with cyanosis and poor pulse. He became unconscious, and after the fit passed off there remained trismus and tonic spasm of the muscles. The respiration remained impaired, and at the commencement of a second fit, ceased for a minute. Subsequently there was œdema of the lungs. There was little change in the blood. The clinical picture closely resembled the acute form of arsenical poisoning, commencing with cerebral symptoms and paralysis of the central nervous system, lungs, and circulatory system. Pathologically the

chief changes consisted in marked fatty degeneration and necrosis in the liver, and destruction of the blood elements in the liver and spleen. This case is further noteworthy for the comparatively small quantity (2·4 gr.) which proved toxic, and indicates that even with all our precautions, unexpected toxic symptoms may arise. As the result of this unfortunate experience, Schlecht suggests that atoxyl should be reserved entirely for those cases of syphilis which resist other better-known and safer forms of treatment.

The report of the German Commission sent out under Koch to East Africa to investigate **Sleeping Sickness** has been published.[10] The report on the action of atoxyl is written by Beck, who states that it was found the most valuable drug in the treatment of the disease. It seemed to prove efficacious at all stages, and he records cases which reacted, though the patient was already comatose or paralyzed. The best method of using the drug consisted in the subcutaneous injection of two doses of 0·4 gram on two succeeding days. As a rule this caused the prompt disappearance of the trypanosomes from the blood and glands, and usually there was no reappearance of the parasites for fourteen to thirty days. He therefore recommends that the double injection should be repeated every tenth and eleventh day. To produce complete cure, prolonged treatment for at least four months is necessary before one can be certain of the disappearance of the parasites. With these comparatively small doses, intoxication symptoms were not common, but occasionally were noticed. The ordinary symptoms were giddiness, vomiting, and colicky pain in the intestine. Sometimes the sclerotic was tinged yellow and the eyelids were swollen, and there was distinct conjunctivitis. A few instances of painful enlargement of the liver were noted. The most serious form of toxic manifestation was connected with the eye. He records twenty-three cases of blindness. The disturbance of vision came on suddenly in most cases, and did not appear to be due to excessive doses. Then, in one instance it appeared after the administration of 3·6 grams during six months, the largest dose being 0·5 gram. In another instance, blindness appeared after four and a half months' treatment consisting of one double dose of 0·4 gram, followed by ten doses of 0·5 gram by the mouth, or in all 5·8 grams. At the commencement, the ophthalmoscopic examination was negative, but in the course of the next three months the optic nerve becomes white, and the veins appear distended. The value of the atoxyl treatment of sleeping sickness is shown in the following table :—

	Slight Cases	Severe Cases	Total
	1259	374	1633
Mortality ..	53=4·2 %	78=20·9 %	131=8 %

Babes, Vasiliu and Georghus[11] recommend as a further step in the atoxyl treatment of **Pellagra** the combination of arsenious acid, both

internally and externally. They report a series of fourteen cases in which this treatment gave extraordinarily good results, a complete cure being obtained in from one to four weeks. The treatment consists in one injection of 50 cgrams atoxyl, and simultaneously from 1 to 4 mgrams of arsenious acid is given in pill form and 5 grams of a 1–50 arsenious acid ointment is rubbed on the sound part of the skin. In slight cases a single treatment was sufficient, but in severe cases the same treatment was repeated on the next day, and, in very severe cases, again, after a week's interval, on two successive days. These doses were well borne even by children weighing only 8 to 20 kilograms. The treatment acts on all the manifestations of the disease. The erythema and œdema first disappear, then the diarrhœa ceases, the mental disturbance, melancholia, and asthenia disappear, and all the patients put on weight. The cure seems to be equally easily obtained in acute and chronic cases which have existed for years. In half the cases all the symptoms had disappeared within ten days, and in the remainder within from ten to twenty-eight days, and the patients remain free from all signs of the disease for several months.

Uhlnehuth and Manteufel[12] find the mercury salt of p-amino-phenylarsenic acid (*mercury atoxylate*) superior to either mercury or atoxyl alone in the treatment of spirochætal disease in animals. A single dose well below the toxic limit kills fowl spirochætes, and a single intramuscular injection affords sure protection against subsequent infection. Similarly a single injection was able to cure syphilis in rabbits without subsequent relapses. In trypanosome diseases the drug had a good effect. Unlike atoxyl, mercury atoxylate rapidly kills spirochætes and trypanosomes in test-tube experiments.

References.—[1]*Münch. med. Woch.* Nov. 10, 1908; [2]*Bull. Soc. Path. Exot.* 1909, t. 2, p. 45; [3]*Berl. klin. Woch.* Mar. 15, 1909; [4]*Hoppe-Seyler Zeits. f. phys. Chem.* Vol. lix. p. 256, in *Brit. Med. Jour.* June 12, 1909; [5]*Sperimentale*, May, June, 1908, in *Centr. f. inn. Med.* Dec. 25, 1908; [6]*Med. Klin.* Sept. 13, 1908, in *Brit. Med. Jour*, Jan. 23, 1909; [7]*Versamml. d. ophth. Gesellsch. Heidelberg*, 1908, in *Brit. Med. Jour.* Dec. 12, 1908; [8]*Berl. klin. Woch.* Jan. 18, 1909; [9]*Münch. med. Woch.* May 11, 1909; [10]*Arbeit. a. d. Kaiser. Gesundheits.* Sept. 1909; [11]*Berl. klin. Woch.* Feb. 8, 1909; [12]*Med. Klin.* Oct. 25, 1908, in *Brit. Med. Jour.* Apr. 3, 1909.

ATROPINE.

Rabl[1] reports four cases of **Incarcerated Hernia** successfully treated with injections of atropine. Large doses are necessary. Thus for a child of three he gave 3 mgrams at once. Four hours later, he showed marked toxic symptoms—furious delirium, clonic spasms, dry hot skin, and rapid heart action. A man of thirty-five was given 6 mgrams, and had slight delirium. The fourth case was that of an old man aged eighty-one, who received one dose of 3 mgrams, and five hours later a second dose of 2 mgrams. In this case the hernia disappeared, but a paralysis of the bladder supervened, though whether due to atropine or not, Rabl cannot say. In all the cases the

hernia disappeared within six to nine hours. He insists on the necessity of large doses, and states that an adult should not receive less than 3 mgrams for the first injection.

REFERENCE.—[1]*Münch. med. Woch.* Oct. 27, 1908.

BISMUTH.

In ordinary medicinal doses bismuth subnitrate is practically without any remote action, but when larger quantities are administered this bismuth salt is by no means free from danger. In recent years the practice of using bismuth suspensions to facilitate the Röntgen examination of the gastro-intestinal organs, has become very general. In most cases the subnitrate has been the salt used, and in quite a number of cases fatal toxic symptoms have developed, due apparently to the reducing action of certain bacteria of the large intestine, which results in the production of nitrites. The symptoms come on acutely within a few hours after the introduction of the salt, and closely resemble those of nitrate poisoning. There is usually some diarrhœa, nausea, and collapse, with marked dyspnœa; but the most striking symptom is the cyanosis of the mucous membranes and the peculiar greyish-green discoloration of the skin. Associated with this is the presence of methæmoglobin in the blood, which becomes chocolate-coloured. The methæmoglobin is not permanent, and disappears after the blood is exposed to air or after death. In the past year Meyer,[1] Kiaer,[2] and Nowak and Gütig[3] have all published fatal instances of bismuth subnitrate poisoning following the use of this salt to facilitate X-ray examination of the stomach or bowel. The mechanism of the poisoning has been investigated by Boehme[4] and Nowak and Gütig.[3] They agree that the poisoning is due to the production of nitrites by certain bacteria, as can easily be shown in test-tube experiments. The fæces of children seem to be specially active in this respect, which perhaps explains why so many of the fatal cases have occurred in children. While dogs and rabbits are difficult to poison with bismuth subnitrate, cats readily succumb with symptoms of nitrate poisoning identical with those observed in human beings. The obvious inference to draw from these experiments is the extreme inadvisability of selecting the subnitrate of bismuth for X-ray work. The carbonate or oxide should be preferred.

Quite another form of chronic bismuth poisoning has also been noticed last year in connection with the use of bismuth-vaseline paste in the treatment of tuberculous sinuses, cavities, and fistulæ. For this purpose a mixture containing 33 per cent bismuth subnitrate incorporated with vaseline is injected into the cavities. It is gradually absorbed, and may produce chronic poisoning, setting in a couple of weeks after the application. Beck[5] has used the bismuth paste for over two and a half years without any serious symptom of poisoning, though he has seen slight lividity of the mucous membranes and skin, and a bluish border at the margin of the teeth, while in another case desquamative nephritis was observed. A more serious intoxication

was reported to him by Roberts which corresponds very closely with other cases recorded by Don,[6] Eggenberger,[7] and David and Kauffman.[8] The chief symptoms are painful ulceration of the tongue, marked stomatitis, with salivation, and loosening of the teeth and fœtor ex ore. A well-marked, bluish-grey line develops on the gums, and may also spread to the tongue and lips (probably due to the formation of bismuth sulphide). In some cases desquamative nephritis has been seen. In cases which survive, the symptoms take a long time to pass off, the line on the gums remaining for weeks.

REFERENCES.—[1]*Ther. Monats.* 1908, p. 388; [2]*Hospitalstidende*, 1908, No. 41; [3]*Berl. klin. Woch.* 1908, No. 39; [4]*Arch. f. Exper. Path. u. Pharm.* Bd. lvii. S. 441; [5]*Jour. Amer. Med. Assoc.* Jan. 2, 1909; [6]*Brit. Med. Jour.* Nov. 28, 1908; [7]*Centr. f. Chir.* 1908, No. 44; [8]*Jour. Amer. Med. Assoc.* Mar. 27, 1909.

BROMGLIDIN.

When introduced in the form of an alkaline salt, bromine is excreted much more slowly than the iodine of the corresponding alkaline iodide. The same was found true by Boruttau[1] for the excretion of the bromine contained in the organic bromalbumin compound, bromglidin. The initial excretion, during the first twenty-four hours, is somewhat more pronounced than with an alkaline bromide, but the remainder of the bromine is very slowly excreted over several days. Bromglidin contains 10 per cent of bromine. After taking six ½-gram tablets daily for four days (= 1½ grams bromine), he found that the quantities of bromine excreted in the urine were on the first six days 0·171; 0·202; 0·217; 0·189; 0·099; 0·017 gram, while traces were still present up to the tenth day. The physiological action of bromglidin is similar to that of the alkaline bromides, but, considering the smaller content of bromine, bromglidin produces a more pronounced sedative effect.

REFERENCE.—[1]*Deut. med. Woch.* Oct. 29, 1908, in *Brit. Med. Jour.* Feb. 13, 1909, and in *Centr. f. inn. Med.* Mär. 6, 1909.

BROMURAL.

This drug, the alpha-monobromisovalerianate of urea, continues to obtain favourable reports. Rémy[1] states that it is quite harmless. Sleep is dreamless, and no unpleasant after-effects are noted on waking. He finds it uncertain in acute infectious disease, but useful in convalescence. It often proves very useful in quieting epileptics, and in mental cases. It is specially successful in **Nervous Sleeplessness.** It is not cumulative, and seems to possess no narcotic action, and thus can only be used to relieve very slight pain, being useless for the severer types of lancinating pain. Grendi[2] also found it without any side effect, and recommends it as a useful sedative, which can be given for prolonged periods in nervous excitability and in different types of nervous sleeplessness. The sleep induced seems closely to approach natural sleep. No alteration is produced in the pulse or blood-pressure, and it seems to be without effect upon the composition of

the blood or on the general metabolism. He found it without any narcotic effect, and states that it does not produce bromism, even after prolonged use. Ubaldo[3] points out that it has a slight effect in checking excessive perspiration. He finds it superior to most hypnotics in irritability of the nervous system and in sleeplessness. In children and infants, in doses of from 0·3 to 0·6 gram, it induces sleep closely approaching natural sleep, and is without any after ill effect.

Ollerenshaw[4] states that with this drug the isolated bromine action does not come into play. No bromine is split off, and after administration the urine contains no trace of bromine or bromides. He considers it an exceedingly reliable and safe hypnotic. It is the ideal drug where a mild hypnotic is required in sleeplessness due simply to slight excitement or overwork. After a dose of 10 gr. the patient will sleep in half an hour, and wakes up without any trace of after-effect. The sleep seems quite normal, and does not at all resemble narcosis.

References.—[1]*Prov. Méd.* 21 Vol. No. 29; [2]*Gaz. deg. Osped.* 1908, p. 95; [3]*Ibid.* 1908, No. 107; [4]*Med. Chron.* Oct. 1908.

BROMVALIDOL.

This drug is the result of an attempt to combine the sedative action of bromine with that of valerian. Schwersenski[1] has accordingly introduced the addition of sodium bromide, and the resulting product, bromvalidol, is warmly recommended by him in **Nervous Irritability** owing to business strain, and in the hysterical state often seen at the commencement of the **Menopause.**

Reference.—[1]*Ther. Monats.* 1908, Hft. xi.

CALCIUM.

A. P. Luff[1] has used calcium with much success in various morbid conditions associated with a deficient coagulability of the blood. The salt he employs is the lactate, which is almost tasteless and does not irritate the stomach. He administers it in 15-gr. doses thrice daily, one hour before food, dissolved in 1 oz. of chloroform water, to which is added ½ to 1 min. of tincture of capsicum. It is important to give the drug before food to obviate any precipitant action of the phosphates or other constituents of the food. The calcium lactate should be fresh, as it decomposes after long keeping. The indication of its freshness is that it should form a clear solution in water, or at least that the solution should only be faintly turbid. Any definite white precipitate indicates chemical alteration and unsuitability. A course of treatment lasts six weeks, and the drug, apart from inducing constipation, seems to be usually well borne. In three cases he has observed a tendency to venous thrombosis, which has necessitated stoppage of the calcium treatment. The constipation is best treated with infusion of senna pods; saline aperients are inadvisable, as apt to affect the calcium salt. The morbid conditions in which the calcium

treatment proved valuable included **Lymphatic Headache, Chilblains,** and various skin diseases associated with deficient coagulability of the blood, as **Urticaria, Boils, Vesicular** or **Bullous Eruptions,** etc. It was successful in three cases of **Hæmoglobinuria,** and in five cases of **Aneurysm** considerable benefit resulted.

Gewin[2] supports Netter's claim that the administration of calcium lactate lessens the liability to serum reactions. In a series of 200 consecutive cases of diphtheria treated with serum, without respect of age, sex, or severity of attack, every alternate patient received calcium lactate for three days. The result showed that the attacks of serum sickness were much less numerous and less severe in the cases treated with calcium,

It has been asserted by MacCullum and Voegtlein that the cause of the tetany seen after the operator's removal of the thyroid gland is really due to the simultaneous removal of the parathyroid glands. The removal of the parathyroids affects calcium metabolism, causing a great increase in the calcium excretion. The administration of calcium almost immediately improves the animals as far as the tetany is concerned. On these grounds it is obviously advisable to try the effect of calcium salts in other forms of tetany. Stone[3] reports a case of tetany of unusual severity, in which the administration of calcium was followed by great improvement. He gave a subcutaneous infusion of normal salt solution, containing 30 gr. of calcium lactate, and every four hours 10 gr. of the same salt were administered in milk through a nasal tube. Improvement began after twenty-four hours, and at the end of three days' treatment the patient could be discharged from hospital.

With a modification of McGowan's method, which he claims gives more accurate results than any other, Addis[4] has tested the effect of calcium on the coagulation time of blood. His results do not bear out the statements of Wright and other workers that soluble calcium salts affect the coagulation time. He records tests carried out on eight cases. A period of about eighteen days was divided into three periods of six days, and during the whole time the coagulation time was taken every other day. During the first period, neither calcium nor citric acid was taken, while in the second period calcium was given, and in the third citric acid, or vice versa. Each coagulation time given represents the average of three observations. The calcium was given as calcium lactate dissolved in water. The total average of the coagulation times taken under these three conditions shows that neither the calcium nor the citric acid had any effect :—

	Total Average Coagulation Time.
Period without calcium or citric acid ..	9 min. 39 sec.
Period in which calcium was taken ..	9 min. 31 sec.
Period in which citric acid was taken ..	9 min. 34 sec.

Calcium was also tested in a well-marked case of **Hæmophilia** with persistent bleeding after the extraction of a tooth. On the sixth day

of bleeding, the coagulation time was 12 min. 35 sec. at 7.30 p.m. At 7.45 p.m., 60 gr. of calcium lactate in solution were taken, but 2¼ hours later the coagulation time was 14 min. 30 sec., and no effect had been produced on the bleeding, which continued for another four days. Calcium given four-hourly did not reduce the coagulation in a case of urticaria. The absence of any effect after administration of calcium and citric acid is because the increase or decrease in the content of the blood in ionizable calcium which follows their administration is far smaller than that amount of change which is necessary to produce an appreciable effect on the coagulation time.

REFERENCES.—[1]*Brit. Med. Jour.* Jan. 30, 1909; [2]*Münch. med. Woch.* Dec. 22, 1908; [3]*Jour. Amer. Med. Assoc.* Apr. 3, 1909; [4]*Brit. Med. Jour.* Apr. 24, 1909.

CAMPHOR

A synthetic preparation of camphor is now put upon the market by Schering, and is supplied at a price which compares favourably with that of natural camphor. It appears to be identical in chemical composition with the natural article, but differs slightly from it in possessing very little rotating power upon polarized light. According to pharmacological experiments of Langaard and Maas,[1] the synthetic preparation shows very little difference in action from the natural product, and causes a little less excitement of the central nervous system.

Würtz[2] prefers subcutaneous injection of camphor to saline infusions in the treatment of the **Collapse** seen in infants after intestinal food intoxication. All food is stopped for from twenty-four to seventy-two hours, and if collapse appears, he injects from ½ to 1 cc. of a 10 per cent solution of camphor in olive oil, and repeats the injection every three hours if necessary.

REFERENCES.—[1]*Brit. Med. Jour.* Nov. 7, 1908; [2]*Münch. med. Woch.* 1909, No. 3.

CAMPHORIC ACID.

Tyrode[1] denies that camphoric acid has any antihydrotic action. His experiments show that the drug has very little action either on the amount of air respired, or on the circulation or isolated heart. The dose of 1 gram of the sodium salt produced no alteration in the metabolism of rabbits, though given for periods of months. The action on the sweat glands was studied on the paws of young cats with completely negative results. After having performed over one hundred experiments upon animals, he is forced to the conclusion that camphoric acid as such acts in the same order as the other organic acids which are not decomposed in the body; that in combination as a sodium salt, which is formed in the intestines, it acts like any neutral salt, such as sodium sulphate—i.e., its ions have so little activity that it possesses only the action derived from its physical properties, "salt action." He further sees no justification in its use

as a respiratory and heart stimulant, nor as an antihydrotic in the tubercular night sweats. Yet it may be of some utility as a urinary antiseptic, because it may have, in common with many other free organic acids, slight antiseptic power.

REFERENCE.—[1]*Bost. Med. and Surg. Jour.* June 11, 1908, in *Ther. Gaz*, Oct. 15, 1908.

CANNABIN TANNATE (Merck).

According to a report by Matthews,[1] this preparation is not likely to find favour. It is a powder with a bitter, astringent taste, and on mucous membranes acts much like tannic acid. In two experiments on dogs it failed to produce any evidence of hypnotic action, and Matthews himself took four doses each of 1 gram at two-hourly intervals without psychic derangement either in the form of stimulation or depression. He concludes that the drug is inert, and possessed of so many undesirable physical properties, as compared with other preparations of cannabis indica, as to render it therapeutically superfluous.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Nov. 21, 1908.

CARBOLIC ACID TABLETS (Diphenyloxalester).

A new form of putting up carbolic acid tablets has been introduced by Schulke and Mayr, of Hamburg. The tablets contain diphenyl-oxalester, a combination in which two molecules of carbolic acid are united by one molecule of oxalic acid. According to Schneider,[1] it is not hygroscopic, and is not nearly so caustic as pure carbolic acid. Dissolved in water, it splits up into its component parts, forming carbolic acid solutions, which, according to him, have four or five times the disinfecting power of corresponding strengths of carbolic acid. This he ascribes to the combined action of carbolic and oxalic acid, of which latter 32 per cent of the compound is formed, the remaining 68 per cent being carbolic acid. The new preparation is put upon the market in 1-gram tablets, which for distinguishing purposes are slightly coloured with a red dye. The tablets dissolve readily in water, but hard water causes slight milkiness from formation of insoluble calcium oxalate. For most purposes a ½ per cent solution is sufficient, as in such strength the solutions have little odour, are devoid of caustic action, and can be used for long periods without irritating the hands.

REFERENCE.—[1]*Hygien. Centr.* Aug. 1908, in *Münch. med. Woch.* Mar. 9, 1909.

CASTOR OIL.

A mixture of subnitrate of bismuth with food enables us to follow on the Röntgen screen the movements of the food along the intestinal tract. Magnus[1] has utilized this fact to investigate the effect of castor oil. He finds that it produces increased peristalsis of the stomach and small intestine, but has comparatively little effect upon the contents of the large intestine. The action is most pronounced on

the small intestine. The fatty nature of the oil counterbalances the stimulant action on the stomach, but if the pure active principle, ricinoleic acid, is administered, or if it splits off in the stomach, the increase of gastric peristalsis is well marked.

REFERENCE.—[1]*Arch. f. d. Gesam. Physiolog.* 1908, cxxii. 5–7.

CERIUM OXALATE.

This drug is recommended by McWalter[1] in inflammatory and erosive conditions of the intestinal mucous membranes, as **Ulcer, Hyperchlorhydria, Hunger Pain,** and allied conditions. He ascribes the good effect not only to the base, but also to the acid radicle, as Nélaton long ago pointed out that oxalic acid in minute dose (1 to 3 gr.) is invaluable in inflammatory conditions of the gastric mucous membrane. McWalter advises that cerium oxalate should be given in powder or mixture. It may be combined with bismuth, e.g., 2 gr. of cerium to 10 of bismuth. It lowers the constipating effect of bismuth and increases the appetite. His advocacy is in accord with the findings of Baehr and Wessler,[2] who state that cerium oxalate is non-toxic, but is not absorbed from the intestinal tract. Though it has no inhibitory effect on vomiting of cerebral origin, it may inhibit vomiting due to local irritation of the gastric mucosa, but only if given in large doses for some time, so as to coat the stomach wall pretty generally. The close analogy of this action to that of bismuth suggests that cerium oxalate ought to prove efficacious in alleviating all those conditions for which bismuth is used, e.g., gastric ulcer, but the dose required is higher than that usually prescribed. As the action is largely mechanical, the dose should be comparable to that of bismuth subnitrate.

REFERENCES.—[1]*Med. Press*, Apr. 21, 1909; [2]*Arch. f. Internat. Med.* Jan. 15, 1909, in *Ther. Gaz.* May, 1909.

COBNUT.

Cash[1] has investigated the purgative action of two varieties of Jamaican cobnut, *Omphalia triandra* and *O. diandra*. The purgative action is apparently due to a bland, fixed oil, which keeps well and does not lose its activity. The taste is far from unpleasant. No nausea or local irritant action is produced by the oil. A slight laxative action was usually obtained with a dose of 18 min., but the effective dose was 30 to 45 min. No drastic effect was obtained with doses of 1 dr. Some diuresis, without vesical irritation, is also seen. This apparently is due to direct action on the kidneys, as the blood-pressure is not affected.

REFERENCE.—[1]*Jour. Physiol.* Feb. 1908.

COLLOIDAL MEDICATION.

Colloidal preparations are extensively employed in France and Germany, but have hitherto found little favour in this country. As used in medical practice, the colloidal substances are usually prepared either by a chemical or by an electrical process. The chemical

preparations are less purely colloidal than those prepared by the electrical process. In the former, the resulting particles are less uniform in size, and are appreciably larger than in the electrically prepared colloidal suspensions, but in both cases they consist of very minute ultramicroscopic solid metallic particles suspended in a fluid, usually distilled water. The colloidal solutions are bad conductors of electricity, and under the influence of weak electric currents all the particles become similarly charged, and pass to one pole, showing the phenomenon of transportation *en masse*, or cataphoresis, whereas weak saline solutions under the same conditions undergo dissociation into differently charged ions. Colloidal solutions are extremely unstable, and are readily precipitated from the colloidal state when brought into contact with acids or bases, or fluids of the body. The medical interest of the colloidal substances depends upon the fact that they possess catalytic properties, and under certain conditions can produce the three reactions of oxidation, hydration, and molecular separation. They also possess bactericidal properties, minute traces being able to inhibit the growth of various micro-organisms *in vitro*. According to various French observers, the colloidal preparations produce a marked leucocytosis and affect metabolism, causing increased output of urea and uric acid, and a diminution in the amount of oxygen consumed in the tissues. They are administered in various ways: by the mouth, rectum, or skin, by injection into the muscular tissue, or directly into a vein. By all these applications numerous observers claim to have obtained more or less satisfactory results in **Local Suppurative Processes,**[1] general **Septic Infections, Rheumatic Fever,**[2] **Pneumonia, Typhoid Fever, Malta Fever,**[3] and in constitutional diseases such as **Diabetes.** Other equally competent investigators deny that colloidal medication is any advance upon the older methods of treatment. They point out the instability of the colloidal substances, and affirm that it has by no means been proved that the colloidal preparations are absorbed as such, or after absorption remain in that state. An example of the favourable report is the long reviews of Bousquet and Roger,[4] but against this must be placed the unbiassed opinion of the committee appointed by the U.S. Council of Pharmacy and Chemistry.[5] This committee investigated certain claims made by the firm of Schering & Glatz for collargol (Credé's colloidal silver). While the report is chiefly concerned with the examination of the literature to which these agents refer in their advertising matter, the committee was evidently not very favourably impressed with the value of the published literature (over 300 articles) adduced in support of collargol. Collargol is one of the chemically prepared colloidal substances, but the chemical preparations are probably more stable than the electrical colloidal preparations, and perhaps a very large part of their adverse criticism of the collargol literature is equally applicable to the colloidal substances prepared electrically.

Izar[6] has noted the therapeutic action of various hydrosols on

infectious diseases. The colloid substances were prepared by himself, and were made from various metals, though his experiments were chiefly carried out with colloidal preparations of silver. The effect of the preparations was chiefly tested in a series of thirty cases of **Pneumonia,** and seemed very similar to that seen in healthy men. As a rule, after the intravenous injection of a small quantity (5 to 10 cc. in healthy men) there is a transient rise of temperature, accompanied sometimes with rigor and a sense of slackness. In pneumonic cases also there is a rise of temperature, followed by rigor, reaching the maximum height in about four hours. This rise is followed by a rapid fall of temperature, associated with marked perspiration. This reaction is much more prolonged in pneumonia than in health. In a few cases there is no subsequent rise of temperature, but in the majority, the temperature rises again to a moderate height before definite defervescence occurs. Even if the temperature rises again, the patients feel subjectively much better, become quieter, and often fall asleep. This euphoria persists for the next two or three days, even though the temperature again rises to considerable heights. Though the colloidal medication has this favourable effect upon the general condition and on the subjective sensations of the patient, it does not seem really to have any ascertainable effect upon the local pneumonic process. The local signs run a normal course, and the critical excretion of chlorides in the urine coincides, not with the fall of temperature, but with the natural termination of the local disease. Izar concludes, therefore, that the colloidal preparations only affect certain symptoms, but do not really check the disease.

In a small series of four cases of acute **Rheumatic Fever,** Izar saw no benefit result from the intravenous injection of colloidal preparations.

Collargol.—Fabian and Knopf[7] have tested the curative action of enemata of collargol in **Rheumatic Fever** and **Gonorrhœal Arthritis.** The procedure adopted was that of Loebl. Morning and evening a cleansing enema is given, followed, half an hour after the action of the bowels, by an injection of 50 ccm. of a 1 per cent solution of collargol, each dose thus containing 0·5 gram of collargol. They used the collargol in spells, each consisting of sixteen enemata in eight days. In a few cases in which it was impossible to retain the enema, the drug was administered by the mouth, 150 cc. of 1 per cent solution in cocoa being given daily, divided into three portions. The results must be considered fairly good. The drug does not seem to act as quickly as aspirin, but from the clinical histories it seems undoubtedly to cure the rheumatic fever. Out of a series of fourteen cases of acute rheumatic polyarthritis, ten were cured with collargol alone; four cases proved refractory, but were subsequently cured under aspirin. The collargol acts decidedly more slowly than the aspirin. It is therefore only indicated in cases of joint disease which do not respond to salicyl preparations or cannot take them. In general, the action of collargol is first seen in diminution of the pain, while the temperature quite

gradually returns to normal. In addition to the cases of acute rheumatic fever, they used collargol in one case of **Post-scarlatinal Rheumatism,** three cases of gonorrhœal arthritis, and two cases of **Cystitis** with septic absorption. All these cases were cured with collargol treatment, but the results were less successful in five cases of septicæmia : only one was cured, the other four succumbed without any apparent action of the collargol on the disease.

References.—[1]*Münch. med. Woch.* July 6, 1909 ; [2]*Berl. klin. Woch.* July 26, 1909 ; [3]*Rev. de Méd.* Dec. 10, 1908 ; [4]*Ibid.* Dec. 1908, Feb. 1909, June, 1909 ; [5]*Jour. Amer. Med. Assoc.* Mar. 13, 1909 ; [6]*Zeits. f. klin Med.* 1909, Vol. lxviii. p. 471 ; [7]*Berl. klin. Woch.* Aug. 26, 1909.

COMBRETUM SUNDIACUM.

Silkworth[1] has published a further report of some cases of **Morphine Addiction** treated by the jungle plant, *Combretum sundiacum*, which show that the cure obtained by this remedy is permanent, and that there has been no desire for a return to opium. The cases recorded were instances of prolonged use of morphia, usually extending for many years. One patient, who had smoked opium for thirty-five years, has remained cured for ten months, and another man, a victim of opium smoking for eighteen years, has been cured for nine months. The drug also seems useful in heroin habit, as a complete recovery has been achieved in a patient who for four years was using heroin to the extent of 7 gr. hypodermically each day. (*See Medical Annual*, 1909, p. 20.)

Reference.—[1]*N.Y. Med. Jour.* Jan. 16, 1909.

CRESOTINIC ACIDS.

May[1] publishes an interesting account of the para-, meta-, and ortho-cresotinic acids, which he finds closely resemble salicylic acid in their action as antifermentatives, bactericides, and antipyretics. Their toxic dose for animals is about the same as salicylic acid. He was able to show that in acute **Rheumatic Fever** the cresotinic acids are possessed of the specific curative action of salicylic acid. Clinically they are employed in the form of sodium salts, with the same dosage as sodium salicylate.

Reference.—[1]*Brit. Med. Jour.* Aug. 28, 1909.

DESALGIN.

Schleich[1] claims to have made an important discovery with regard to chloroform. If mixed intimately with colloid substances, albumin, dextrose, etc., chloroform forms a mechanical mixture in which for a while the volatile chloroform is retained, but, in attempting to dry such mixtures, every trace of chloroform is lost. After many experiments he claims to have discovered one form of albumin (no details are given) which binds the chloroform so thoroughly that it retains it even when dried. To this preparation he gives the name desalgin. It contains about 25 per cent of chloroform, and is a grey, amorphous,

fine powder which he says contains chloroform in a colloid form. It can be taken in doses of half a teaspoonful—either alone, or in tea, milk, or mineral waters—without producing any local irritant action. In these large doses occasionally a slight degree of stimulation is experienced, which, he thinks, corresponds to the initial excitement seen in chloroform anæsthesia. He found from personal experience that desalgin often cut short commencing attacks of **Gastric Colic** when given in half-teaspoonful dose, and that the drug does not lose its effect for a considerable period. He refers to a series of 34 typical cases of gall-stone trouble which he has treated with small doses (as much as will lie on the point of a penknife) thrice daily for three weeks. In 22 patients the results were excellent, but with the remaining 12 no benefit was obtained. Similar results were obtained by colleagues who tried the drug at Carlsbad. The good effect he thinks may be due to the drug causing hyperæmia of the gastric mucous membrane, which may reflexly induce increased secretion of bile. Further, he states that chloroform markedly checks intestinal bacterial growth, which again may reduce catarrhal and infectious processes in the gall-bladder. In general terms he states desalgin relieves pain coming from any organ covered with peritoneum, and is excellent for colic arising from the gall-bladder or gastro-intestinal tract. It is also useful in **Dysmenorrhœa** and **Tabetic Pains.** The chloroform is excreted partly by the breath, and possibly that explains the good effect seen in **Asthmatic** and **Bronchitic Attacks.**

REFERENCE.—[1]*Ther. d. Gegenw.* 1909, No. 3.

DIGITALIN TABLETS.

The ordinary digitalin tablets for hypodermic use contain $\frac{1}{100}$–$\frac{1}{50}$ gr. of digitalin. According to Edmunds and Roth,[1] this quantity is much too small. They compared the action of digitalin tablets and tincture of digitalis on the frog's heart and on the dog, and found that $\frac{1}{250}$ gr. of digitalin was equivalent in action to 0·2 cc. of the tincture. As the dose of the tincture is 1 cc., the corresponding dose of digitalin should be $\frac{1}{5}$ gr., or for purposes of safety this amount may be halved $= \frac{1}{100}$ gr. They point out that Beates, in 1897, used $\frac{1}{4}$-gr. doses of digitalin for months without any harmful results, and in emergencies administered $\frac{1}{2}$ gr. every two hours for a few doses.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Dec. 19, 1908.

DIPLOSAL.

According to Haynes,[1] this new preparation is theoretically the best of all the salicylic acid derivatives. It is salicyl-salicylic acid, the salicylic ester of salicylic acid formed by the condensation of two molecules of salicylic acid, $HO{\cdot}C_6H_4{\cdot}COOH + HO{\cdot}C_6H_4{\cdot}COOH = HO{\cdot}C_6H_4{\cdot}COO{\cdot}C_6H_4{\cdot}COOH + H_2O$. It therefore contains more salicylic acid than either salol (phenyl salicylate) or aspirin (acetyl-salicylic acid). Sodium salicylate itself contains 86 per cent, aspirin 77 per cent, salol 66 per cent salicylic acid; but 100 parts

diplosal, by taking up water in the tissues, form 107 parts salicylic acid. Though practically insoluble in water, diplosal forms alkaline salts. In test experiments it was boiled with known strengths of alkali and acid to determine what probable changes would be induced by the action of the intestinal juices. A known quantity of diplosal was dissolved in KOH, and sufficient H_2SO_4 was added to neutralize all the alkali left, and to make the acidity equivalent to that of 0·3 per cent HCl, i.e., that of the normal gastric juice. This mixture was subjected to the heat of a briskly-boiling water bath for thirty minutes, at the end of which time it was found that no hydrolysis had taken place. This indicates that there is little chance of the normal amount of HCl present in the gastric juice liberating the irritating pure salicylic acid from the diplosal. Somewhat similar experiments with alkalies carried out at blood heat showed that under the action of alkalies, of such strength as occur normally in the intestine, a rapid hydrolysis of diplosal takes place into salicylic acid. This would be quickly absorbed as salicylate of sodium.

Levy[2] has used diplosal in eighty cases of **Acute and Chronic Rheumatism, Sciatica,** and **Muscular Rheumatism,** with satisfactory results. The maximum daily dose was 6 grams in 1 gram doses, usually given in milk or gruel. As a rule it was very well borne. With 4 grams daily he never had any complaint of ringing in the ears, but with 5 to 6 grams daily tinnitus was occasionally observed, especially in female patients. The general action seems similar to that of the salicylate of soda. In acute rheumatism the specific effect is seen in two or three days, shown by fall of temperature and disappearance of pain and swelling.

Minkowski[3] has achieved good results with this preparation in **Acute Rheumatism, Neuralgia, Cystitis,** etc. It is well borne in doses of 5 to 6 grams daily; it did not produce gastric disturbance, and never gave rise to tinnitus, even in patients susceptible to salicylic acid.

References.—[1]*Folia Therap.* Jan. 1909; [2]*Med. Klin.* 1908, No. 46; [3]*Ther. d. Gegenw.* Sept. 1908.

DISINFECTANTS.

The necessity of possessing a standard for disinfectants has to some extent been overcome by the adoption of Rideal and Walker's test, whereby we determine what dilution of the antiseptic kills the test germ, usually *Bacillus typhosus*, in the same time that a 1 per cent solution of carbolic acid kills it. This method is of considerable value, but it is not always possible to distinguish between an inhibitory effect preventing growth, and a true germicidal effect. Possibly it is due to this that in the hands of different skilled workers varying results are obtained. With what is stated to be a better test, viz., the "garnet" test devised by Paul and Krönig, Laubenheimer has investigated the disinfectant action of a number of phenol bodies on *Staphylococcus pyogenes aureus*. His method and results are described in the *British*

Medical Journal of July 24th, from which we reproduce the following table, showing a few of his most important results :—

Substance Tested.	Strength of Solution.	Time of Contact required to kill *S. pyogenes aureus.*
	per cent.	
Pure carbolic acid	1·0	90 minutes
Lysol	2·0	5 ,,
Liquor cresoli saponatus (containing 50 per cent cresol)	2·0	4 ,,
Corrosive sublimate	0·1	30 ,,
Eucalyptol	1·0	6 hours
Menthol	1·0	6 ,,
Beta-naphthol	1·0	15 minutes
Thymol	1·0	3 ,,
Propyl-phenol	1·0	3 ,,
O-xylenol	1·0	30 seconds
M-xylenol	1·0	30 ,,
P-xylenol	1·0	9 minutes
Chlor-o-cresol	1·0	2 ,,
Chlor-m-cresol	1·0	30 seconds
Chlor-m-cresol	0·5	1 minute
Chlor-m-cresol	0·25	1 ,,
Chlor-m-cresol	0·1	10 minutes

We see that the cresols (the methyl phenols) possess a greater bacterial power than phenol, while the dimethyl phenols (xylenols) are more powerful than cresols. With the increase in bactericidal action the toxicity for higher forms of life diminishes. The cresols are less toxic than the phenols, and the xylenols are less toxic than the cresols. Some of the chloride derivatives of the cresols are even more powerfully bactericidal than the xylenols.

1 per cent of	m-xylenol	killed	staphylococci	in 30 seconds
0·5 per cent	,,	,,	,,	2 minutes
0·25 per cent	,,	,,	,,	25 minutes
1 per cent of	chlor-m-cresol		,,	30 seconds
0·5 per cent	,,	,,	,,	1 minute
0·25 per cent	,,	,,	,,	1 minute
0·1 per cent	,,	,,	,,	10 minutes

1-22,000 of chlor-m-cresol prevented growth ; 0·1 per cent corrosive sublimate required thirty minutes. On guinea-pigs the minimum lethal dose per kilo. body weight of m-xylenol was 1·75 gram, while that of chlor-m-cresol was 4·0 grams. These bodies are only slightly irritant in weak solutions. A solution of 0·25 per cent chlor-m-cresol does not irritate the eye of a rabbit. This chlor-m-cresol is stated to be effectual for sterilizing the hands, if a 1 per cent alcoholic solution is applied after thoroughly washing. For disinfecting tuberculous sputum it is not so efficient as m-xylenol. When 5 per cent solutions are used, three hours' contact with m-xylenol proved necessary, while chlor-m-cresol required eight hours. A 5 per cent solution of lysol tested in the same 'way, i.e., without thorough mixing with the sputum, required over twenty-four hours.

EPSOM SALTS.

Fraser[1] records the case of a boy, aged 3½ years, who took by mistake for sugar a heaped-up teaspoonful of Epsom salts. Severe symptoms developed. There was immediate retching and gastric pain, which continued throughout the day. About five hours later, vomiting appeared. He received some castor oil, but the bowels did not act. When seen by Fraser, twenty-five hours after the salts were taken, the child was very ill, with colicky pain every two minutes and intense thirst. Only about half an ounce of urine had been passed, but only another half ounce of muddy, non-albuminous, very acid urine could be drawn off when a catheter was passed. The temperature was 100·5°, and the abdomen was tense, hyperæsthetic, and dull at the flanks. Later a diagnosis of peritonitis was made, and, on laparotomy being performed, 2 pints of sterile, blood-stained serum was drawn off. The appendix was healthy, and no cause of obstruction was found. For the next two days the boy was apparently moribund, but, on the third day the bowels moved frequently, and the child eventually made a good recovery. Fraser does not think that there was either a volvulus or intussusception. He has been able to collect six cases of Epsom salts producing poisonous symptoms.

Ridley[2] has used Epsom salts successfully in two cases of **Warts.** A girl, aged 20 years, had suffered from warts for six years. With drachm doses of Epsom salts thrice daily the warts had completely disappeared in six weeks. In the second case, a child aged ten years, drachm doses were given twice daily for three months.

The percutaneous application of magnesium ions is stated by Bordet[3] to have rapidly cured two cases of flat warts. He used a 5 per cent solution of magnesium sulphate connected with the positive pole.

References.—[1]*Lancet*, Apr. 24, 1909; [2]*Ibid.* May 15, 1909; [3]*Archiv. d'Elect. Méd.* Mar. 10, 1908.

ERGOT.

Goodall[1] has tested a number of samples of liquid extract of ergot, and finds that they vary very much. He made observations upon the blood-pressure in rabbits and cats under full anæsthesia by ether. In a series of samples submitted by manufacturing chemists to be tested physiologically, he found that 70 per cent of them failed to cause a rise of 30 mm. of mercury in the carotid blood-pressure, while 41 per cent failed to cause a rise of 20 mm. All the specimens were tested by injection of the drug into the jugular vein, and in every case there was at first a fall of pressure, followed by a return to normal or a rise above it. In a second series of ordinary commercial samples obtained in the open market from chemists or manufacturing houses, he found that 76 per cent failed to raise the blood-pressure 20 mm. of mercury.

In a third series, combined observations were made upon the power of the preparation to cause rise of blood-pressure and uterine

contraction. Of the samples tested, 66 per cent caused a well-marked uterine contraction, and 85 per cent a contraction of some sort. The contraction was caused in 14 out of 21 samples by doses which did not produce any rise of blood-pressure. Ergot seems, therefore, to have a specific action on the uterus, irrespective of pregnancy. He concludes that it is necessary to have ergot preparations tested pharmacologically, and suggests as satisfactory tests either the action on the uterus or on the blood-pressure. For the latter a fair standard would be that a dose of 20 mm. injected intravenously should cause a rise of blood-pressure of 20 mm. of mercury in an anæsthetized animal of 1500 grams. In the present state of knowledge it is hardly possible to adjust the therapeutic dosage of ergot to pharmacological findings. The prescriber should have some guarantee that his ergot is active, and should administer it only in doses which his experience has taught him to be sufficient and safe.

REFERENCE.—[1]*Edin. Med. Jour.* July, 1909.

ESCALIN (An Aluminium-glycerin Paste).

Hernaman-Johnson[1] has used an aluminium glycerin-paste in several cases of **Gastro-intestinal Disorder,** and finds it useful when bismuth has failed. The preparation he uses is known by the trade name "escalin," and is a paste made up of two parts finely powdered aluminium to one part glycerin. Of this paste about one drachm was taken and crushed into small lumps, which are then transferred to an 8-oz. bottle and thoroughly shaken with 1 oz. of glycerin and 4 oz. of water till all lumps disappear. The bottle is filled up, and is then ready for use. The dose varies, according to the severity of the case, from ½ oz. t.i.d. between meals to 1 oz. every two hours, and there should be complete abstinence from solid food. Before use the bottle is well shaken till it appears like silver paint, and then the dose is poured into a spoon and swallowed immediately. It has a slightly metallic, sweet taste. Though these doses are rather smaller than those officially recommended, he finds them sufficient. The action seems purely mechanical, a protective covering being formed over the diseased gastric and intestinal surfaces. The aluminium appears in the fæces in from six to twenty-four hours after ingestion, and appears to have no side-effects. Though somewhat expensive, he suggests that aluminium paste may be tried in chronic and intractable lesions of the intestinal tract which do not react to bismuth.

Aluminium was introduced by Klemperer as a substitute for bismuth in the treatment of gastric hæmorrhage. The last report from his clinique is published by Jacobsohn.[2] He deals with 33 cases of **Gastric Ulcer,** of which 22 showed melæna and hæmatemesis and the remainder only blood in the stools. Though a comparatively unrestricted diet was allowed (with small quantities of milk on the first day, and on the third day white of egg and zwieback), the blood in the stools soon

disappeared, as a rule in three to six days, and at the latest in from eight to ten days after the first dose of escalin. Jacobsohn holds that gastric hæmorrhages which do not yield to escalin are not caused by simple ulcer, but depend on cancer or cirrhosis of the liver. This favourable report is in marked contrast to the very guarded praise of escalin which is given by Steinberg,[3] who analyzes the results obtained with it in Stadelmann's clinique. His conclusion is that neither aluminium (in the form of escalin) nor bismuth, nor any other metallic preparation given by the mouth, has any effect in causing gastric ulcers to heal more rapidly than they do under dietetic treatment. Without suitable dietetic treatment it does not much matter what drug is used.

Sussmann[4] finds escalin suppositories a decided advance in the treatment of **Anal Fissure.** He recommends that the suppository should be slightly warmed to facilitate its introduction. Two should be used each day, one after defæcation and the other on retiring to rest. The advantage of escalin is that it is extremely adherent and gives a firm coating over the fissure, protecting it from dirt and injury. He also finds the suppositories useful for checking the **Bleeding of Piles.**

REFERENCES.—[1]*Med. Press*, Aug. 11, 1909; [2]*Ther. d. Gegenw.* Feb. 1909; [3]*Berl. klin. Woch.* Apr. 23, 1909; [4]*Ther. d. Gegenw.* May, 1908.

EUBORNYL.

To intensify the sedative action of bornyval, Luedy[1] has introduced bromine into the compound. He has succeeded in producing a bromisovalerian-borneol ester, a body of a syrupy consistence and pleasant, aromatic odour, insoluble in water, but soluble in alcohol, ether, and chloroform. To this substance he has given the name eubornyl.

Allina[2] found it a useful sedative for allaying anxiety, e.g., before small operations, and also in more serious forms of **Nervous Excitement.** He also considers that the drug is of value in **Painful Erections** associated with disease of the male genital organs.

REFERENCES.—[1]*Pharmaz. Zentralhalle*, 1908, No. 22, in *Centr. f. inn. Med.* Nov. 21, 1908; [2]*Ther. d. Gegenw.* Apr. 1909.

EUPHYLLIN.

This new diuretic is a combination of theophyllin and ethylene-diamine. Owing to its solubility it is easily absorbed, and can be given by the rectum as suppository or enema. Possibly of greater value is the fact that it can be given by intramuscular injection, which may prove of value in the treatment of **Uræmic Conditions.** A disadvantage is that the action of the drug is not long maintained. According to Dessauer[1] it can only be given for four days on end, when a short interval must be made. The special indication for euphyllin is the rapid removal of **Fluid Exudations.** It acts best where the œdema is associated with primary weakness of the heart, but it also acts well

in renal disease, provided the parenchymatous tissue is not extensively destroyed. He recommends the use of suppositories containing 0·36 gram as the most suitable form for administration. One may be inserted two to four times in the day. The dose for intramuscular injection is 1·5 cc. of a solution of 2·4 grams in 10 cc. of water. Three or four injections may be given daily. For oral administration he gives 1 teaspoonful every two hours of the following mixture:—Euphyllin 1 gram, water 160 cc., syrup and tinct. of orange, of each 20 cc.

REFERENCE.—[1]*Ther. Monats.* 1908, No. 8, in *Berl. klin. Woch.* Nov. 2, 1908.

GARCIA NUTANS.

Cash[1] has investigated these purgative Jamaican seeds. He finds that they contain a fixed oil, which accounts for some, but not all, of their purgative action. The seeds in large dose have a prompt drastic action, but the oil is milder. The oil rapidly undergoes changes in condition and activity. In 6-min. doses a single soft motion is produced without discomfort in about six hours. Half this dose was unreliable.

REFERENCE.—[1]*Jour. of Physiol.* Feb. 1908.

GELATIN.

L. J. Facio,[1] of Buenos Aires, states that the subcutaneous injection of 25 cc. of a 1 per cent solution of gelatin promptly relieves **Pain** of various conditions, pleurisy—articular pain, progressive paralysis, etc. The action is less marked than that of morphia, but lasts much longer, usually for twenty-four hours, sometimes for two or three days. In relieving **Aneurysmal Pain,** its action is better even than morphia. The first injection always diminished the pain, which ceased entirely after the second or third injection. Chaput[2] advises more general use of gelatin injections as a preliminary procedure to diminish **Hæmorrhage in Operations.** He treats secondary hæmorrhage after laparotomy (which he thinks is due to liquefaction of the clot by micro-organisms) by raising the foot of the bed, local application of an ice-bag, and injection into the thigh of 500 cc. of a 1 per cent solution of gelatin. He also advises this use of gelatin in every case of **Ruptured Tubal Pregnancy,** so that, if operation should be necessary, the patient is in good condition for it.

REFERENCES.—[1]*Semana Medica,* Nov. 5, 1908, in *Jour. Amer. Med. Assoc.*; [2]*Bull. Soc. Méd. des Hôp. de Paris,* Nov. 26, 1908, in *Jour. Amer. Med. Assoc.*

GUAIACOL.

When first introduced as an antiphlogistic and antineuralgic remedy, guaiacol was used in large doses and in strong percentages. After such applications collapse not infrequently followed, and consequently the drug was soon looked upon with disfavour by medical men. Hecht[1] considers that the drug was employed in much too concentrated a form, and states that, when dilute application in the form of 10 per cent solutions or ointments are used, there should be no fear of untoward results. He recommends local application in cutaneous

Furunculosis, commencing **Phlegmons, Phlebitis,** and **Tendo-vaginitis.** He finds that the pain is rapidly relieved and the fever often reduced. It is specially useful as a 10 per cent ointment made up with iodine and vasogen in **Periostitis** of young children. In severe **Pleurisy** of children he uses a 10 per cent ointment containing salicylic acid. In pneumonia he thinks that the only effect is reduction of the temperature, and the same is true for inunctions in phthisis. On the other hand he warmly recommends the application of a 5 per cent ointment in **Mumps,** while in **Gout** a 20 per cent solution in olive oil gives relief.

REFERENCE.—[1]*Ther. de Gegenw.* July, 1909.

HOLADIN.

This is an extract of the whole pancreas, and is said to represent all the constituents of the gland, and to exhibit in marked degree the characteristic actions of the various enzymes. It is a greyish-white powder, slightly aromatic in taste and odour, and freely soluble in water. It is said to be specially potent in respect of amylolytic and lipolytic properties. It is supplied by Fairchild Brothers & Foster, New York, in capsules containing approximately 3 gr., and is administered three hours after meals in cases where there is disturbed digestion due to faulty pancreatic functioning.

REFERENCE.—[1]*Amer. Med.* Nov. 1908.

HORSE SERUM. (*See* SERUM-THERAPY.)

HYDROGEN PEROXIDE.

The use of hydrogen peroxide as an antiseptic mouth-wash is fairly common, and it may interest those who are in the habit of using it for this purpose to know that marked blackening of the dorsal surface of the tongue may result. Bizard[1] draws attention to three cases in which he observed this change, and states that the blackness passes away in a few days when the drug is stopped.

REFERENCE.—[1]*Nouv. Remèd.*, in *Lancet*, Oct. 31, 1908.

INTESTINAL ANTISEPTICS.

Friedenwald and Leitz[1] have tested the effect of certain intestinal antiseptics on the bacterial content of the fæces. They used Strasburger's method, in which the bacteria are isolated by centrifugalizing a known weight of fæces intimately mixed with water. Owing to the organisms being almost similar in weight to the water, they remain suspended, but the heavier fæcal particles separate out. The watery bacterial suspension is decanted, and alcohol is added to reduce the specific gravity, whereupon centrifugalization throws down the bacteria, which are then dried and weighed. The following drugs were investigated both in normal individuals and in patients suffering from digestive disturbances: beta-naphthol, bismuth salicylate, salol, aspirin, ichthalbin, lactobacilline, thiocol, bichloride of mercury, and thymol. They found that beta-naphthol and bismuth salicylate were the most effectual intestinal antiseptic drugs in normal

individuals; aspirin and ichthalbin effect slight reduction, but salol gives no results whatever. In patients suffering from gastro-intestinal disturbances, no marked results were produced by intestinal antiseptics, the best effects being obtained by regulation of the diet.

REFERENCE.—[1]*Amer. Jour. Med. Sci.* Nov. 1909.

INTRAVENOUS TREATMENT.

In a clinical lecture on the present position of intravenous treatment Mendel[1] briefly surveys and discusses the drugs which are suitable for this form of therapy. With oral administration more or less complex changes take place before the drug reaches the circulation, and owing to the irregularity of absorption it is impossible to be certain how much of the drug is at any given moment in the circulation. With intravenous injection the drug gets into the blood-stream and acts in full dose. It has been suggested that the full action may not be maintained long, but Mendel thinks that his own observations with the intravenous administration of salicylates and iodides prove that excretion is retarded rather than hastened. Medicines that can be used intravenously without danger, and so avoid any local or general mischief, and, above all, thromboses and emboli, must have the three following properties: (1) They must not set up any coagulation of the fluids of the blood; (2) They must not in any way injure the corpuscular elements of the blood; (3) They must not injuriously interfere with the normal function of the endothelium of the veins, as only a healthy vein wall can prevent the formation of thrombi. It will naturally also be understood that all medicaments are to be excluded from intravenous injection that may choke the capillaries either by their consistence, their aggregate constitution, or admixture of bodily elements. If a medicament fulfils these conditions, the intravenous administration of it may be said to be free from danger, apart from its pharmacological and dynamic properties.

The *technique* of intravenous injection is exceedingly simple, and may be carried out easily and without danger, as well in the consulting-room as at the bedside. The apparatus that the firm of J. & H. Lieberg, of Cassel, made from his instructions, and supplied in a very handy case, consists of a band of black indiarubber 6 cm. in width and about 1 metre in length, and a Lieberg 2-gram syringe, with a not too fine platinum-iridium needle. In the Lieberg case are two needles in a metallic cover, in which they can at the same time be sterilized. There is also in the case an ether bottle with an ingenious stopper, and room for the ampullæ, with the medicines.

After the cannula has been boiled in water, and the needle which is to be used has been washed, and some of the same water passed through, it is filled with the medicine, the needle fixed firmly, and the air driven out of both syringe and needle. The veins at the flexure of the elbow are then closed by the elastic ligature, and the point of puncture rubbed with sulphuric ether. That vein is selected that

seems the most tense and adherent to the skin, so that the needle, on entering, cannot slip aside. Then the cannula, firmly fixed on the syringe, is passed straight in, and when we see the column of blood mounting in the cannula and syringe, forced there by the strong pressure on the contents of the vein, showing that the cannula is really in the lumen of the vein, or when we have satisfied ourselves of this by drawing slightly on the piston, then slowly and under equable pressure the contents of the syringe are passed into the vein. After the cannula has been withdrawn, and a pledget of gauze placed on the site of the puncture, the bandage is taken off. Many loosen the ligature, or allow the patient to do so, before emptying the syringe, as soon as the cannula has entered the lumen of the vein. This method has the advantage that the medicine at once pours into the open channel of the vein, and in this way any lengthened contact of the drug with the wall of the vein is avoided. We must act thus when large quantities of fluid are to be injected at once. It has, however, the disadvantage that, after loosening the ligature, the needle may easily become displaced by movements of the arm.

Mendel has often made 50 or more injections in the same spot of the same vein, without being able to detect the slightest trace of irritation or thrombus. For any damage to the intima of the vein and the formation of thrombus due to it, the character of the fluid injected is responsible. When some of the fluid injected, instead of going into the vein, gets into the perivenous tissue, most intravenous medicaments set up painful inflammations and infiltrations, and consequently it is advisable to carry out intravenous injections only with medicines which are sterilized in individual doses, and preserved in sealed glass ampullæ, to be secure from germs and decomposition.

For intravenous arsenical treatment he uses a 15 per cent solution of *atoxyl*. Treatment is begun with $\frac{1}{3}$ gram of this solution, gradually increasing up to 2 grams = 0·3 gram atoxyl, which he considers the maximum dose. The injection is repeated, every second day generally for four weeks, then twice a week, then once a week to the end of the course. Atoxyl may thus be used in all the diseases in which arsenic is indicated, e.g., in blood disorders, leukæmia, anæmia, chlorosis, skin diseases, glandular swellings, nervous diseases, as neurasthenia, chorea, asthma, neuritis, etc. Combined with tuberculin, it gives good results in tuberculosis. For the treatment of **Syphilis** and parasyphilitic affections he has always been unsuccessful when using large doses either subcutaneously or intravenously, but the administration of small doses gradually increasing from 0·05 gram to 0·15 gram has given better results. Sodium salicylate in the form of *attritin* is very effective when given intravenously for the relief of pain in afebrile forms of **Rheumatism.**

For **Heart Medication** he employs chiefly *digitalone*, a preparation containing all the glucosides of digitalis leaf. He finds the intravenous use of the preparation perfectly harmless, while marked digitalis action soon comes on, the height of the action being obtained usually

in a few minutes; but the effect ceases very gradually in from twenty-four to thirty-six hours. *Strophanthin* gives a quicker effect, but is not without danger. *Sodium iodide* has not given good results in syphilis, but he has used it with remarkable success in parenchymatous struma and in arteriosclerosis. He uses apparently 2 cc. of a 20 per cent solution. The iodide is excreted by the kidneys, and he finds this a useful guide for determining their condition. In healthy individuals a dose of 0·4 gram takes between twenty and thirty hours, whereas often in renal and cardiac disease a trace of iodide may still be seen, after fifty or sixty hours.

REFERENCE.—[1]*Med. Press*, Mar. 3 and 10, 1909.

INUNCTION.

Rachford[1] considers inunction a valuable method of administering certain drugs to young children. A disturbing influence upon digestion is avoided, and consequently such drugs as iodide can be easily given. Further, drugs given by inunction do not pass directly to the liver, as happens with those administered by the mouth. Infants respond better than adults to inunction treatment, because the surface of the skin in proportion to body weight is four times greater than in adults. The vasomotor mechanism is more responsive in children to external stimuli such as friction and heat, and this facilitates absorption. Further, the lymphatic circulation in the skin, he thinks, is more active in children than adults. In view of the fact that in young children, and especially in infants, the nutritional problems are of much greater importance than in adults, it is wise to avoid giving any drug by the mouth liable to upset digestion if it can be given by other methods. He tested a series of drugs and found that, made up in the proportion of 1 drachm to 2 oz. of anhydrous lanolin, *guaiacol*, *oil of wintergreen*, and *salicylic acid* were readily absorbed, while sodium could be given in the form of 6 per cent *iodine-vasogen*. The technique employed was as follows: The skin of the chest and abdomen was carefully cleaned with soap and water, and hot, moist towels were then applied for a few minutes to warm and redden the skin. One drachm of the ointment was then very carefully rubbed into the skin of the chest and abdomen for from five to ten minutes. Examination of the urine showed that the drugs were absorbed. Thus administered, guaiacol is a valuable remedy in **Tuberculosis of Lymphatic Glands** and in **Non-tuberculous Lymphatic Gland Enlargement.** It is specially useful in **Pulmonary Tuberculosis,** and in all diseases in which an expectorant is required. Indeed, for years he has quite given up using expectorant mixtures by the mouth in treating infants, and has replaced them by guaiacol inunctions.

REFERENCE.—[1]*Amer. Jour. Med. Sci.* Jan. 1909.

IODIVAL.

Iodival (monoiod-isovalerianylurea) is recommended as a substitute for the alkaline iodides. It is said to contain 47 per cent of iodine. Insoluble in cold water but soluble in hot, it passes through the

stomach unchanged, but is readily dissolved in the alkaline intestinal contents. The excretion of iodine is slow, and prolonged over several days after a single dose. With the ordinary dose of 0·3 gram thrice daily, Ernert[1] states that as intense an iodide action is obtained as with 1-gram doses of KI thrice daily. This he ascribes to the theory that iodival is stored up in the fat and nervous tissue, from which it is slowly liberated, consequently a gentle, prolonged iodine action is obtained. It is therefore specially indicated for the treatment of **Diseases of the Nervous System.**

REFERENCE.—[1]*Pharmaz. Zentralhalle*, 1908, No. 43.

IODOFORM.

Bain[1] reports a small series of six cases of **Phthisis** which were successfully treated with Dewar's method of intravenous iodoform injections. The clinical histories appear to warrant his claim that iodoform used in this way exerts a markedly beneficial effect. The patients belonged to the working classes, and were treated at home under not particularly good hygienic conditions. The intravenous injections were given every second day at first, but towards the end of treatment every third day. The median basilic vein was usually selected, but any other vein will do. If properly given the injection causes no local pain, but if it is made too rapidly the patients often complain of a feeling of having been struck a severe blow on the chest or shoulder. He has never noticed breathlessness after an injection, but violent coughing is common, and may necessitate giving up the injections. After large doses the patient may complain on the following day of severe headache and pain over the whole body, especially the lumbar region. The solution Bain uses is that recommended by Dewar: Liquid paraffin 40 per cent, anæsthetic ether 60 per cent. In each 20 min. dissolve 1 gr. of iodoform. Ten min. (½ gr. of iodoform) is the ordinary dose, but it is well to commence with a smaller one of 5 min.

REFERENCE.—[1]*Glas. Med. Jour.* May, 1909.

IODOMENIN.

This is a new iodine compound in which the iodine in combination with bismuth is united to albumin. It is supposed to pass through the stomach unchanged, and to be split up only when it reaches the alkaline juices of the intestine, whence it is absorbed as an alkaline iodide. The absorption of iodine is therefore slower than with alkaline iodides administered by the mouth. Friedmann[1] states that the relative potency of iodomenin is about one-eighth that of an alkaline iodide. He has used it with successful results in all conditions in which iodides are indicated. It was well borne by patients who were unable to take iodides without suffering from iodism. The taste is pleasant, and he recommends it for those cases where a prolonged iodine treatment is necessary, e.g., **Arteriosclerosis.** Cassel[2] advises the use of iodomenin in treating children. He found it very useful

in **Congenital Syphilitic Symptoms** appearing about the third or fourth year, and for **Bronchitis** in children of all ages.

REFERENCES.—[1]*Berl. klin. Woch.* Mar. 15, 1909; [2]*Ther. d. Gegenw.* 1908, No. 7.

ISOPRAL.

According to Ollerenshaw,[1] this drug is a fairly good **Hypnotic,** though it cannot be called a powerful one. He considers it stronger than bromural but less strong than veronal as a hypnotic. The isopral sleep was not so sound as after veronal, but the patients slept well, and there was no drowsiness next day. The hypnotic action is developed in from fifteen to fifty minutes after its administration, and appears to extend over ten hours or so. He confirms Förster's statement that isopral exercises its hypnotic effect when administered through the skin by means of an inunction. He uses the following solution, which must be freshly prepared. Thirty grains of isopral are dissolved in 10 grams of absolute alcohol, and then mixed with castor oil. This solution is applied to the thighs with the hand. No irritation is noticed, but the person applying the solution may absorb some of the drug unless the hand is well greased with lanolin or vaseline, and afterwards thoroughly scrubbed with soap and water. In his observations no depression of the heart was seen, but the results in cardiac insomnia were variable; in some cases it acted extremely well, but in others no hypnotic effect was observed. Peters[2] also recommends isopral as a safe hypnotic in **Cardiac Cases,** and denies that it has any depressant action on the heart or circulation. He states that it can be used with safety even in advanced heart disease. Wassermeyer[3] agrees with Peters that there is no depressant action on the circulation, and states that he has used it in severe heart disease without any unfavourable result. In mental cases he has used isopral largely as a sedative, and has had to employ as much as 45 gr. as a dose, but even the large dose produced no unpleasant symptoms. He finds it very useful in allaying spasms of all types. In the **Status Epilepticus** he considers it superior to chloral, its action being more rapidly obtained and lasting longer. For such cases he employs a rectal injection of from 3 to 5 grams dissolved in a mixture of alcohol and ether. Even in cases of ordinary **Epilepsy** it sometimes proves better than bromides, reducing the number of the attacks and producing much less depression than the bromides. The dose employed for this purpose was from 0·5 to 1 gram twice or thrice daily. He thinks that it has a depressant action on the cerebral cortex, and has utilized this property of the drug in one-sided convulsions due to **Cerebral Hæmorrhages** into the cortex. Similarly it allays the twitching of **Chorea** and some forms of **Tic.** In chorea major, when the jerking is so severe that the patients cannot take nourishment and are in danger of hurting themselves, isopral produces sleep lasting for several hours, and on waking the twitching of the muscles is less marked for some hours, so that the patient can take nourishment.

REFERENCES.—[1]*Med. Chron.* Oct. 1908; [2]*Deut. med. Woch.* Oct. 29, 1908, in *Brit. Med. Jour.*; [3]*Berl. klin. Woch.* Aug. 2, 1909.

LACTIC ACID BACILLI.

The practical difficulties of carrying out the treatment with lactic-acid-producing bacilli are emphasized by several writers. Walker Hall and W. A. Smith[1] determined the inhibiting action of certain types of lactic acid bacilli. The majority of these ferments are sold in the form of dry tablets, obtained by inoculating the milk with an organism, evaporating, and then compressing the residue, or by mixing a dried culture of the organism with a suitable excipient. These tablets are directed to be added to milk which has been boiled for a short time and then allowed to cool; the milk is then to be kept at blood heat for six to eight hours. After this period of incubation the milk is said to be sufficiently "soured" for therapeutic uses. In a few cases it is advised to dissolve the tablets in sweetened water before consumption. The object of these procedures is the introduction of lactic acid bacilli into the ileum and colon to inhibit the action of putrefactive bacteria.

The results of the simple experiments they carried out tend to show that the ferments at present on the market do not achieve the end in view, and they suggest that until there is a decided improvement in the processes of manufacture the dangers attendant upon the use of these tablets outweigh their benefits. Whenever the treatment is specifically indicated it would be well to obtain young, active, and specially adapted (aerobic and anaerobic) cultures in a fluid medium from local public health or other laboratories, and to determine the efficacy of the organism by bacteriological examinations of the fæces. With suitable media and precautions, such a proceeding need not involve more than the outlay of a few shillings, and the ultimate expense will be considerably less than that occasioned by the longer haphazard medication with inert or inefficacious material.

They point out that the ordinary process of pasteurizing or sterilizing milk does not ensure complete sterilization, but merely kills some of the milk organisms, so that the remaining germs multiply more rapidly than usual. The addition of "ferments" to such imperfectly sterilized milk induces considerable antagonism between the added bacilli and the unkilled organisms. They conclude, therefore, that milk is an unsafe medium for administering the bacilli, and suggest administering the cultures preferably in a liquid sugar medium.

They tested a number of ferments according to the accompanying manufacturers' directions, with somewhat unsatisfactory results. The unkilled organisms in the milk grew rapidly, and the introduction of the lactic acid bacilli produced an antagonism leading to a minimal growth of both types of organisms and the production of only a small quantity of acidity. When inert or almost inert tablets were used, the resistant milk organisms have it all their own way, and may produce intestine-irritating products. "Souring" cannot be obtained in six to eight hours, as this time is far too short for the hibernating bacilli in the tablets to regain their normal activity. They found that sixteen to twenty-four hours was the average period necessary. In some of the tablets examined, the bacilli did not survive the

action of artificial gastric juice. Only five out of ten samples gave good growths in artificial gastric juice media. They suggest, therefore, the necessity of training the organisms to appreciate an acid medium, i.e., the culture should be grown and administered in an acid broth. With such cultures, accustomed to live under anaerobic conditions, or administered in a specific acid medium, the lactic acid bacilli appear in the stools within a day, whereas with the ordinary tablet-bacilli five days are required. The life of the bacilli in the intestine seems to be about the same as in artificial media, i.e., about five to seven days, suggesting that this is the suitable period between doses. The bacilli apparently do not become readily acclimatized to the intestine, and should only be used as temporary interlopers to enable the normal flora to regain their sway as soon as the objectionable putrefactive anaerobes are overcome. Lactic-acid therapy is only indicated when these putrefactive germs are present in the fæces in excess. The commercial tablets differ considerably: some contain diplococci, sporulating bacteria, streptococci, or yeasts. Even the best commercial preparations are not sufficiently and regularly active for routine use, and differ in their power of producing acid and in their inhibiting action on other organisms.

To ensure reasonable sterilization of the milk, Allen[2] found that it was necessary to maintain it near the boiling point for almost an hour. Merely raising the temperature to the boiling point and allowing it then to cool to 40° C. was quite inadequate. Several samples so treated, and then incubated for eight to ten hours, were found to be simply swarming with sporing and non-sporing organisms, including the *Streptococcus pyogenes longus*.

A number of commercial lactic ferments were tested by the *British Medical Journal* authorities[3] for their lactic-acid-forming properties. The effect of each preparation was tested on milk which had been only brought to the boil and then allowed to cool to 40°, and also on milk which had been thoroughly sterilized by being brought to the boil and then kept in a boiling water bath for one hour. The acidity was determined by titration. The milk used was the ordinary supply of one of the large dairy companies in London, except that in column Ia, which was obtained from a country dairy, and free from the addition of any preservative. The results, showing the percentage of lactic acid produced, appear in the following table :—

Sample	Milk brought to boil only		Milk kept at boiling temperature for 1 hour		
	I. 10 hours	II. 22 hours (partly cold)	I. 10 hours	Ia. 10 hours	II. 22 hours (partly cold)
Fermenlactyl tablets	0·00	0·10	0·00	0·09	0·13
Lactobacillin tablets	0·00	0·05	0·00	0·02	0·10
Oppenheimer's cultures	1·02	1·10	0·75	0·96	0·98
Sauerin tablets	0·04	0·23	0·03	0·07	0·21
Trilactine tablets	0·00	0·09	0·03	0·27	0·26

Some irregularities are shown by the results of different tests on the same product, and these appear to be due to variations in the individual tablets and cultures. The actual formation of curd was approximately proportional to the acidity found by titration. The product was agreeable to taste, and free from bitterness in each case.

Heinemann[4] has similarly investigated a number of lactic acid ferments used in America, but apparently thinks that there is no convincing evidence that sour milk prepared with commercial cultures is preferable to naturally sour milk, as far as the therapeutic effect is concerned. Most of the commercial tablets contain *B. bulgaricus*, *Streptococcus lacticus*, and yeasts. There is no convincing evidence that *B. bulgaricus* is superior to *S. lacticus* in arresting intestinal putrefaction, while its effect in splitting up fat produces a more unpleasant taste.

Norman[5] has noted marked improvement after the use of lactic acid bacilli in a well-marked case of **Hypochondriacal Melancholia.**

The treatment of gastro-intestinal affections by lactic acid preparations is well known, and has been much advocated. Some less known applications have been suggested. Gordon Dill[6] obtained marked improvement with lactobacillin in a case of pernicious anæmia which had resisted arsenic, intestinal antiseptics, and vaccine treatment.

Allen[2] finds that lactic acid applications do well in cases of **Chronic Gleet,** partially cured, in which the bacteria keeping up the discharge are resident upon the surface of the mucosa and not in the glands of Littre and the lacunæ. He injects night and morning with an ordinary syringe one ounce of filtered milk culture. In a typical case, on the day following the first instillation there was slight increase of discharge, which diminished rapidly upon subsequent days, and considerable itching of the urethra. On the eighth day only lactic acid bacilli were found in smear preparations and in cultures, and a thorough flushing of the urethra with weak permanganate solution rapidly removed the lactic acid, leaving sterile secretion.

Kern[7] studied the effect of the *B. bulgaricus* upon the growth of *B. coli*. He found that the administration of Yoghourt milk diminished the number of coli bacilli in the fæces. In vitro the *B. bulgaricus* seems to have a slight effect in inhibiting the growth of *B. coli* in bouillon, but the extracted toxins of *B. bulgaricus* have a more pronounced action.

North[8] recommended the use of lactic acid cultures in the treatment of **Infectious Disorders** of the nose and throat and other body cavities which can be reached by a spray or wash. He grew the bacilli in large flasks containing one to two litres of dextrose broth, to which were added several lumps of marble. The calcium carbonate keeps down the acidity, and enables him to obtain abundant growth of the bacilli. After incubating for about eighteen hours the culture may be poured into smaller receptacles, and the bacilli continue to multiply for several days. As a rule the culture was used about a day old. It takes about three or four days for the bacilli to settle to the bottom

of the medium, and the culture used should not be more than four days old. At his suggestion a number of practitioners have used the preparation, in all in some 300 cases, with the result shown in the following table :—

Disease	Cases	Cured	Improved	No Result
Atrophic Rhinitis	56	—	50	6
Ethmoiditis	34	5	24	5
Frontal Sinusitis	21	11	6	4
Acute Rhinitis	51	14	—	37
Hay Fever	11	—	10	1
Otitis Media	14	—	10	4
Chronic Rhinitis	5	—	5	—
Tuberculous Sinuses ..	10	—	—	10
Antrum	8	—	4	4
Gonorrhœa	28	2	26	—
Suppurating Wounds ..	10	—	5	5
Peritonitis	2	2	—	—
Cystitis	2	—	2	—
Leucorrhœa	7	—	4	3
Diarrhœa	11	2	4	5
Rigg's Disease	5	—	5	—
Gonorrhœal Ophthalmia ..	19	17	—	2
Conjunctivitis	10	10	—	—
Total	304	63	155	86

Method of Administration.—The broth culture is used in its full strength without dilution. The inflamed surfaces to which it is to be applied may first be cleansed with warm saline solution to remove adherent mucus, pus, or other matter which may interfere with the culture reaching the inflamed tissue itself. Theoretically the object sought is to bring the culture of lactic acid bacteria into direct contact with the bacteria which are causing inflammation of the membrane. Thus, in the nose and throat a preliminary cleansing is often of advantage, for otherwise the culture might be administered without actually reaching more than a small portion of the inflamed areas. Antiseptics should not be used in connection with this treatment. A syringe or spray apparatus is used to inject the culture fluid into the cavity and direct the stream upon the tissue surfaces. Proper precautions should be exercised to prevent contamination of the culture when removing it from its original container and in the syringe. The dose varies according to the extent of the inflammation. For the nostrils from 1 to 5 cc. is usually injected into each. As a gargle in the throat or as an injection into the intestine much more is used at one time. In fact, since it may be drunk by the glass with no harmful effects, so far as discovered, there is probably no danger in using large doses.

North's general conclusions are as follows : (1) That the bacillus of Massol can be grown abundantly in dextrose bouillon by the addition of lumps of calcium carbonate ; (2) That the use of these cultures as

a wash or spray on inflamed surfaces or cavities often diminishes the discharge upon such surfaces or cavities; (3) That the use of these cultures often diminishes odour caused by putrefaction; (4) That the treatment sometimes reduces swelling, especially in the erectile tissues of the nose; (5) That both acute and chronic inflammations caused by infections sometimes appear to be checked when their seat can be reached by an injection of these cultures; (6) That the use of the cultures seems to be accompanied by no special danger, and that they cause no irritation.

REFERENCES.—[1]*Brit. Med. Jour.* Mar. 20, 1909; [2]*Ibid.* Nov. 28, 1908; [3]*Ibid.* Jan. 9, 1909; [4]*Jour. Amer. Med. Assoc.* Jan. 30, 1909; [5]*Brit. Med. Jour.* May 22, 1909; [6]*Lancet*, Nov. 28, 1908; [7]*Zeits. f. klin. Med.* 1909, Vol. lxvii. p. 211; [8]*Med. Rec.* Mar. 27, 1909.

LACTOIOD.

The number of organic iodine combinations introduced as improvements on the alkaline iodides is steadily increasing. Lactoiod is a combination of iodine and pure milk albumin containing about 5 per cent iodine in sufficiently firm combination to resist the action of weak alkalies and acid, but in the tissues it is split up and iodine is liberated. Stanjeck[1] has tested it in a small number (seventeen) of suitable cases, and finds that the iodine action is satisfactorily shown, though it appears to act rather more slowly than the ordinary alkaline iodides. The iodine is slowly given off, and in animals, after a single dose the excretion is prolonged over eight days. In man, the drug is promptly absorbed, but is not very quickly excreted, so that if the administration is continued a considerable retention of iodine takes place. Thus in one case during ten days' administration, 255 grams of lactoiod = 12·75 grams of iodine were given, but only 6 grams were excreted in the urine and fæces. In a second case with similar doses 9·4 grams of iodine were given off. One special advantage he notes is that the new drug stimulates nutrition and the patient puts on weight. This is perhaps not to be wondered at, as the drug is comparatively poor in iodine, and therefore the dose is large, 15 to 30 grams daily, so that in this way large quantities of albumin are being administered.

REFERENCE.—[1]*Ther. d. Gegenw.* Apr. 1909.

LACTO-SERUM. (*See* SERUM-THERAPY.)

LECITHIN.

According to Wilczinski,[1] lecithin has the effect of retarding the onset of the **Menstrual Period.** For this purpose he has used it in a number of cases where menstruation was too frequent or where he desired to retard the onset of menstruation in anæmia. He claims to be able to change the type of menstruation from bi-monthly to monthly or, when it is normal, retard it for one or two weeks. He gives from 10 to 20 cgrams thrice daily for ten to fifteen days in the intermenstrual period. Prolonged administration produces no unpleasant effect.

Erben[2] found in two cases of diabetes a diminution in the lecithin content of the red blood cells. The administration of lecithin had, however, no effect upon the disease.

REFERENCES.—[1]*Sem. Méd.* Apr. 7, 1909; [2]*Prag. med. Woch.* 1908, No. 24.

LEUCOCYTE EXTRACT.

A certain opposition to the well-known views of Wright regarding phagocytosis is arising. According to Wright, the process of phagocytosis depends entirely upon the opsonins present in the serum, while the source of the white phagocyting cells is immaterial. Hiss[1] does not entirely agree with this view. He found in a number of instances that the phagocytic power of the white blood corpuscles is affected by the infection, and varies independently of the opsonic content of the serum. He believes it is probable that, during the initial stages of an infection and up to the height of its development, the phagocytic power of the leucocytes was depressed. As immunity or cure is obtained, the phagocytic power is increased. On theoretical grounds he assumes two classes of bodies which protect an infected organism. The one class, constituting the antitoxins, bacteriolysins, agglutinins, etc., are readily over-produced and thrown off by the cells into the blood-stream. Consequently they are available for the general protection of all the tissues. He recognizes a second great class of protecting bodies, which are essentially intracellular in their action, and serve to protect the individual cells against the poison by some poison-destroying action inside the cell after the poison has penetrated the individual cells. Such endo-antitoxins are as a general rule not given off into the blood-stream. Hence their action in protecting the infected animal is indirectly effected, i.e., only in so far as a part of the poison is destroyed inside the cells. He thought that it might be of advantage in the protective fight if such endo-antitoxic bodies were extracted, and then introduced in a free state into the infected animal, whereby he hoped to increase the protection of the tissues in general. As the most suitable cells to work with, he selected the leucocytes, which can readily be obtained by injection of aleuronate into the pleural cavity. The leucocytes so obtained are washed free from plasma and then extracted with water. He used chiefly the leucocytes obtained from healthy rabbits, and found that the extract had a distinct modifying or curative action when given subcutaneously or intraperitoneally even in systemic infections which are rapidly fatal in control rabbits not treated with the leucocyte extract. The action of the extract may be due to the enhancement of the bacteriolytic action of the animal's serum by the introduction of complement or to the action of digestive substances usually not liberated from the leucocytes; but is most likely chiefly due to poison-neutralizing or destroying bodies, which act on the endotoxins, and thus relieve the leucocytes from fatal poisoning and protect the higher cells of the animal so that their functions are not deranged. He tested this particular effect against staphylococcic, streptococcic,

pneumococcic, typhoid, and meningococcic infection. In many cases there was a marked fall in temperature, with conservation of the animal's weight or a rapid return to normal weight, though for a time the treated animals may seem much more ill than the controls.

In a further paper, Zinsser and Hiss[2] attempt to ascertain more definitely the mode of action of the aqueous extract of leucocytes. They found that the aqueous extract of rabbit leucocytes, intraperitoneally injected into guinea-pigs, exerts marked protective influence upon peritoneal infection with *Vibrio choleræ asiaticæ* and pneumococcus. Slight, if any, bactericidal influence was shown by the extract, neither does it inhibit to any extent the development of these bacteria, nor does it directly increase intraperitoneal phagocytosis. They found that there was a more rapid and more numerous accumulation of polynuclear leucocytes in the peritoneum, possibly due to the extract neutralizing some negatively chemiotactic bacterial products; and the favourable influence upon temperature, general condition, and result of the infection is, they think, probably dependent upon a faculty of neutralization against certain toxic bacterial products.

These observers[3] then proceeded to test the value of the leucocytic extract in man. They used aqueous extractions of rabbit-leucocytes subcutaneously administered. No harmful action was seen. Local reactions were invariably slight, lasting at most for a few hours. Twenty-two cases of **Cerebrospinal Meningitis** were treated, with the result that fourteen were dismissed cured and without sequelæ. Eight cases died, often after showing improvement under treatment, while the life seems to have been prolonged. Almost without exception there was an improvement in those symptoms dependent upon the central nervous system: vomiting, delirium, stupor, and hyperæsthesia were usually diminished or entirely allayed after one or two administrations of quantities ranging from 5 to 20 cc. The promptness of action seems to exclude the improvement being due to anatomical changes, and indicates that, as in animals, the effect is neutralization of poisons. Fever was often markedly reduced; in some cases, however, only temporarily, for twenty-four to forty-eight hours.

The effects in eight cases of **Pneumonia** were also favourable, and again seem probably of the nature of a poison-neutralizing action, but the length of the disease was not apparently affected. All the cases recovered. These series of cases are of course too small to be of much statistical value, but the observation of the individual cases gave the impression that the injection of the leucocyte extract was of beneficial effect.

Lambert[4] has also used extract of leucocytes in various acute infectious diseases. Some of his cases formed part of the series described by Hiss and Zinsser. Three cases of ulcerative endocarditis did not prove particularly amenable to the injections. In malaria the injections had little effect; but brilliant results were

obtained in local infections with pyogenic cocci, e.g., in **Furunculosis** and **Erysipelas.** He thinks the following conclusions justified: We have a new remedy representing a new point of view in the study of immunity, proving an endocellular immunity in addition to the accepted types of serum immunity and of phagocytosis. This remedy is applicable to obscure cases of unknown bacterial origin, to cases of disease with unknown or unapproachable lesions. The remedy influences the toxæmia of the disease and gives an opportunity to the body cells to overcome the infection by removing from them the necessity of immediately attacking the endotoxins of the bacteria. It is by no means a "cure-all." It does not cure every case and it produces no miracles. In application it is painful locally, but it has caused no other local complication, and the urticaria so often seen in the use of serum has been conspicuous by its absence.

REFERENCES.—[1]*Jour. Med. Research*, Nov. 1908; [2]*Ibid.*; [3]*Ibid.*; [4]*Amer. Jour. Med. Sci.* Apr. 1909.

MENTHOL.

Meredith Young[1] pleads for a more extended use of menthol. For internal use he recommends validol (menthol valerianate), which is less irritating to the gastric mucous membrane than menthol. It is of value in the **Vomiting of Pregnancy,** and can either be given as validol, or 15 gr. of menthol may be dissolved in 6 dr. of rectified spirit and made up to 6 oz. with water. The dose is one tablespoonful. It is useful in **Hysteria** and in **Asthma** not due to renal, cardiac, or pulmonary disease, while its carminative effect is well worth trying in **Flatulence** and **Tympanites.** It gave great relief in an advanced case of **Ménière's Disease,** relieving the nausea and giddiness.

REFERENCE.—[1]*Med. Press*, Dec. 2, 1908.

MERCURY.

A new preparation for external use is described by Dupuy.[1] It is the oleobrassidate of mercury obtained by allowing erudic acid, obtained from rape oil, and oleic acid to act on mercuric oxide. During the process the erudic acid passes into its isomer, brassidic acid, and the result is the formation of a mixture of transparent yellow jelly, the oleate and brassidate of mercury, containing 30 per cent of mercury. Rubbed on the skin it produces no greasy sensation, does not irritate, and is readily absorbed. It does not stain linen. He recommends it instead of mercurial ointment, and states that it does not produce stomatitis. He has used it since 1906 with excellent results in **Syphilis,** using about 18 grams daily as a dose, equal to about 90 grains of metallic mercury; but according to the susceptibility of the patient the daily dose may vary from 10 to 20 grams. The applications should be slowly made and take about ten minutes, and it is well not to wash the part for several hours afterwards. The inunctions are repeated daily for thirty days.

REFERENCE.—[1]*Nouv. Remèd.*, in *Lancet*, July 31, 1909.

METHYLENE BLUE.

The local application of chemically pure methylene blue in the form of powder to the lesion of **Ulcerative Stomatitis** and **Tonsillitis** is warmly recommended in France. It acts well in ulcerative conditions of the bucco-pharyngeal mucosa, and has a very good effect, almost specific, in **Vincent's Angina.** The pure powder is applied to the ulcerated area, and the effects are almost instantaneous.

REFERENCE.—[1]*Hosp.* Feb. 27, 1909.

MORPHIA.

Morphosan.—The conversion of morphia into morphinbrom methylate retains all the morphine action, but the toxicity is much reduced, being only about one-tenth that of the hydrochloride of morphia. Under the name morphosan the drug has been introduced into the market. Hirschlaff[1] has used it with advantage for practically all the actions of morphia—relief of pain and cough, to induce sleep, etc. He also finds it useful in breaking patients from the morphia habit. It seems fairly safe even for children, but the daily dose should not exceed 0·3 gram (5 gr.) for children and 0·75 to 1 gram (12 to 15 gr.) for adults. For internal administration to children he gives 0·02 to 0·1 gram in powder, or as a 5 per cent solution. For adults, double these doses may be used. For subcutaneous injection the dose is 0·1 to 0·25 gram = 2 to 5 cc. of the 5 per cent solution. This solution is apt to turn brown when sterilized, and then the salt readily crystallizes out; in which case it should be slightly warmed before injection, to ensure solution.

Pantopon.—The suggestion of Sahli[2] that all the alkaloids contained in opium should be used instead of morphia alone does not seem likely to prove of much practical value. It is well known that the alkaloidal content of opium varies very much, and even the percentage of morphia is by no means constant. As the action of many of the other alkaloids contained in opium is not definitely understood, it would seem highly inexpedient to resort to a mixture containing varying quantities of alkaloids whose action is not thoroughly worked out. However, such a mixture of the total alkaloids isolated in the form of hydrochlorides has been prepared, and is called pantopon. It contains 89·77 per cent of alkaloidal matter. In activity 1 gram pantopon corresponds to 5 grams of opium = 0·5 gram morphia + 0·4 gram of other alkaloids. The preparation is a fluid made with glycerin and water, and does not cause pain when injected. It can be sterilized by heat without decomposing. For the relief of **Pain, Dyspnœa,** or **Sleeplessness,** 2 cgrams of the total alkaloids in a 2 per cent solution can be given hypodermically, but for more serious forms of excitement, e.g., **Delirium Tremens,** double this quantity can be given. Internally the dose is 1 to 2 cgrams in the form of pills or powders. The preparation is not more apt to induce constipation than morphia. It remains to be seen by more extended use whether this mixture of the total alkaloids presents any improvement on the use of morphia alone, or whether it possesses any special therapeutic indication.

REFERENCES.—[1]*Ther. Monats.* 1908, Hft. x–xi.; [2]*Ibid*, 1909, No. 1.

NASTIN. (*See* VACCINES.)

NEURALTEIN.

Amore[1] tested this new analgesic remedy in thirty-seven cases of various painful diseases. Neuraltein is allied chemically to phenacetin, differing in the substitution of methan-sulphonate for the acid radicle. It occurs as white, shining scales, soluble in water, with a slight saline taste, not unpleasant. He found it an effectual **Analgesic,** free from toxic or unpleasant qualities. The usual dose was 50 cgrams every two to four hours. It is not cumulative, and has no bad influence on the heart, blood, or other tissues. It is easily and rapidly absorbed, while it does not seem to lose its effect even with repeated and prolonged administration.

REFERENCE.—[1]*Gaz. deg. Osped.* Sept. 20, 1908, in *Brit. Med. Jour.* Oct. 24, 1908.

NEURIPRIN.

This substance, an extract of nervous tissue, has been favourably commented on by Roasenda[1] as a specific nerve tonic. He has used it with success in **Epilepsy, Graves' Disease,** and **Neurasthenia** (especially when marked by insomnia, mental and physical excitability followed by speedy exhaustion). He believes neuriprin to be a good nerve sedative and tonic, without ill effects, which may prove a useful substitute for bromides and other sedatives in certain cases.

REFERENCE.—[1]*Gaz. deg. Osped.* 1909, No. 21, in *Brit. Med. Jour.* Apr. 3, 1909.

OPSONIC INDEX. (*See* VACCINES.)

PARATHYROID GLAND.

Parathyroid preparations are being extensively used in Italy. A recent writer recommends them in severe cases of chorea which resist other methods of treatment, but yield readily to parathyroid medication. The conclusion drawn is that in addition to the unknown infectious element, there is a second etiological factor present due to deficient functioning of the parathyroid glands. In **Senile Tremor** and in **Parkinson's Disease,** Massaglia obtained good results with the parathyroid treatment in a number of cases.

The physiological function of the parathyroid gland continues to arouse interest among physiologists. It is known that surgical removal of the glands is followed by acute tetany. Further, there is great excretion of calcium, so that the tissues contain much less than their normal content. The intravenous injection of soluble calcium salts immediately relieves the symptoms of tetany. On these facts McCallum[1] has suggested that the parathyroid glands deal with calcium metabolism, and that the cause of the tetany is deficiency in calcium. Along with Voegtlin he has shown the controlling influence of calcium salts upon the spasm of experimental tetany. A rival theory states that the cause of the tetany is a toxin formed by a disturbance of metabolism. It is pointed out that bleeding temporarily relieves

the tetany, which can hardly be expected if the deficiency in calcium is the real cause of the symptoms, as bleeding will of course accentuate the calcium deficiency. Berkeley and Beebe[2] have carried out an elaborate research on dogs, and come to the conclusion that the toxin theory is more likely to be correct. They find that, in addition to calcium, strontium and, to lesser extent, barium and magnesium salts also temporarily relieve the symptoms if injected into the vein of a dog suffering from experimental tetany. They have prepared a nucleoproteid substance from parathyroid gland, and find that it effectually relieves the tetany if given by the mouth, but is much more quickly and certainly effective when given subcutaneously or intraperitoneally. With the parathyroid nucleoproteid experiments were made on thirty-two animals having typical symptoms of tetany, and 95 per cent of the trials have been successful. They believe that the essential fact in the production of symptoms following complete thyroparathyroidectomy is the deranged metabolism giving rise to some active poison, and not merely the abnormal excretion of calcium, which they regard simply as an accompanying phenomenon.

That the disturbed function of the parathyroid glands is not the only cause of tetany is shown by a case of gastric tetany reported by Kinnicutt.[3] In this case the intravenous administration of calcium lactate temporarily controlled the spasm, but to maintain this effect required repeated use of the calcium salt. Beebe's nucleoproteid preparation of parathyroid gland had but slight influence, if any, in controlling the hyper-excitability of the nervous system when given by the mouth. Possibly this is due to the fact that in this case the parathyroid bodies appeared to be quite normal, and were presumably of normal functioning power.

References.—[1]*Jour. Exper. Med.* 1909, xi. 118; [2]*Jour. Med. Research*, Feb. 1909; [3]*Amer. Jour. M. Sci.* July, 1909.

PERGENOL (Hydrogen Peroxide).

A crystalline powder, soluble in water, chemically pergenol is a mixture of sodium perborate and acid sodium tartrate. In solution it forms hydrogen peroxide, and is recommended by Meyer[1] as an improvement on the official solution of hydrogen peroxide, in that it is easily carried and does not deteriorate in the dry form. Weak solutions (0·5 per cent) are useful for disinfecting the mouth and teeth. Stronger solutions (1 to 2 per cent) are required for loosening nasal tampons and removing crusts. Sprayed upon a firmly adherent tampon, marked foaming is caused, and the tampon separates without much bleeding.

Reference.—[1]*Berl. klin. Woch.* Aug. 16, 1909.

PERGLUTYL.[1]

This is a new solid form of hydrogen peroxide. It is prepared by dissolving gelatin in hydrogen dioxide by the aid of gentle heat, and adding sufficient glycerin to yield a solid product when cooled. By

varying the proportions of glycerin and gelatin, the melting point can be altered considerably. The perglutyls on the market melt between 77° and 104° F. The indications for the use of perglutyl preparations are the same as those of ordinary hydrogen peroxide.

Reference.—[1]*N.Y. Med. Jour.* Nov. 7, 1908.

PHENOLPHTHALEIN.

Phenolphthalein has been used as a purgative for eight years; yet we are still somewhat uncertain how it acts. It was asserted that after passing unchanged through the acid contents of the stomach, it forms a sodium salt in the intestines when brought into contact with the bile, and that it is to the salt that the purgative action is due. As a purge, phenolphthalein is much less active in dogs than in man, and the explanation offered was that there was less of the sodium salt formed in dogs. Elmer[1] has investigated this point on three dogs. He administered large doses of the drug suspended in water, in $\frac{N}{40}$ sodium hydrate, and in 0·3 per cent hydrochloric acid, but found that there was little difference in the effect. The sodium medium led to a slightly greater absorption, but there was not sufficient difference to warrant a conclusion that sodium plays any part in the purgative action.

Phenolphthalein seems to be only very slightly toxic. In dogs, up to 1 gr. per kilo. of body weight can be given without danger, and in four patients 30 gr. or more have been given daily for at least two weeks, one taking from 30 to 60 gr. daily for fourteen months without ill effect. Esner considers that it can certainly be given with safety up to 20 or 30 gr. daily. It is not broken down in the body, but is almost entirely excreted unchanged in the fæces. After very large doses some appears in the urine. He finds from an analysis of 112 cases that the dose varied from 1 to 10 gr., with an average of 3½ gr. Hæmorrhoids were not aggravated by phenolphthalein. It also acted in two cases of catarrhal jaundice in ordinary doses, though in neither case did the stools contain bile. He prefers to give the drug in the form of a powder rather than as a capsule.

The non-toxicity of phenolphthalein is shown by Gillette's[2] report of the case of a child aged three years and a few months, who swallowed 25 tablets each containing one grain. The stomach was washed out about ninety minutes after the child swallowed the tablets, but nothing was obtained. Beyond a few fæcal movements, the child did not show any effects of the drug.

Berthoumeau and Daguin[3] have investigated the action of phenolphthalein. According to them it has little effect upon the heart, blood-pressure, respiratory organs, or nervous system, or on the functions of the various abdominal organs. The purgative action requires direct contact with the intestine, and is not seen after intravenous administration; it is associated both with increased muscular contractions and intestinal secretions.

Aperitol.—To overcome any tendency to griping, occasionally

produced by phenolphthalein, Hammer and Vieth[1] have combined a sedative with the purgative drug. They find that valerianic acid forms a stable chemical combination with phenolphthalein, the divalerianic acid ester of phenolphthalein, a white crystalline powder, without taste or odour. It is claimed that this compound, to which the name aperitol has been given, passes through the stomach unchanged and only splits up in the intestine. It produces usually only a single soft stool in about twelve hours, and seems to have no irritating effect on the kidneys in the usual dose of 3 or 4 gr.

REFERENCES.—[1]*Med. Rec.* Nov. 14, 1908.; [2]*Jour. Amer. Med. Assoc.* Nov. 21, 1908; [3]*Presse Méd.* 1908, No. 48; [4]*Med. Klin.* 1908, No. 37.

PHOSPHORUS.

Birk[1] finds that in **Rickets** the metabolism of mineral material is upset. In many cases the output of salts is greater than the intake. In such cases the administration of phosphorus in cod-liver oil caused an improvement, in respect that an increased retention of calcium and magnesium takes place; but it has no effect upon the phosphorus metabolism. He considers that the calcium retention arose chiefly through the cod-liver oil. Schabad[2] investigated the same problem, but explains the retention of calcium on a somewhat different basis. Thus, though in a rickety child the calcium deficiency was converted in a retention under the action of cod-liver oil, still the addition of phosphorus to the oil made a further increase in the amount of calcium retained. Contrary to the finding of Birk, Schabad states that, with the administration of phosphorus and cod-liver oil, more phosphorus is absorbed and retained in the body.

In a subsequent paper Schabad[3] states that, in therapeutical doses, phosphorus increases the retention of calcium of rickety but not of healthy children. More calcium is absorbed and less is excreted in the urine and fæces. The increased retention of calcium is produced very rapidly, and is visible after three to five days' treatment with phosphorus. On stopping the administration of phosphorus, the retention of calcium still continues, but gradually falls to the normal. Thus, after two and a half months' treatment with phosphorus, the calcium retention remained above the normal for two months. He concludes that phosphorus has a specific action on the rachitic bones, bringing their calcium content up to normal.

REFERENCES.—[1]*Monats. f. Kinderheilk.* Nov. 1908; [2]*Zeits f. klin. Med.* 1909, *Bd.* 68, *Hft.* 1, 2; [3]*Ibid.* 1909, Bd. 67, Hft. 5, 6.

PILOCARPINE.

Montefusco[1] recommends the subcutaneous injection of small doses of pilocarpine—$\frac{1}{2}$ to 1 mgram.—in cases of **Laryngeal Stenosis in Measles.** In forty-five cases so treated the mortality was only 4·4 per cent, whereas the former method of treatment with antidiphtheritic serum gave a mortality of 25·9 per cent.

REFERENCE.—[1]*Gior. Internaz. d. Scienz. Med.* 1908, No. 7.

PITUITARY EXTRACT.

Houghton and Merrill[1] have studied the diuretic action of the active principle of pituitary gland. In healthy men they were unable to detect much diuretic effect, though relatively large doses of the pituitary extract were given internally. There was a slight increase in the amount of urine, but not sufficient to say positively that it caused any marked diuretic action on persons in health. On healthy dogs the results were even more irregular; but when the experiments were carried out on dogs anæsthetized with morphine and chloretone, the pituitary extract had a distinct diuretic action. They do not, however, agree with Schäfer that this increase is due to a special hormon with a specific influence upon the functions of the kidney, and ascribe the increase in diuresis to the increase in blood-pressure. By perfusion experiments on the isolated kidney, they found that the addition of pituitary extract to the perfusing 1 per cent physiological salt solution does not increase the urethral or venous flow. Consequently they hold that any specific action on the kidney must be less than that of 1 per cent solution of sodium chloride, as otherwise it would manifest itself by greatly increased flow of urine when brought into contact with the secretory cells of the kidney.

Reference.—[1]*Jour. Amer. Med. Assoc.* Nov. 28, 1908.

PNEUMIN.

Pneumin is a yellowish-white odourless powder obtained chemically by the action of formaldehyde on creosote. It has recently been noted by Eschbaum[1] in a small series of sixteen cases of **Phthisis.** The most noticeable effect was increase of appetite, but no direct effect was seen in the objective signs of the local disease, nor did it affect in any way the cough, sputum, or night sweats. In tuberculous ulceration of the intestine, in two cases, it increased diarrhœa. Pneumin is without any taste, and is administered in doses of 1 gram thrice daily before meals. The patients readily took it, and preferred it to creosote owing to its tastelessness and unirritating properties. It should not be given to patients suffering from hyperacidity, as it seems to increase the pain.

Reference.—[1]*Münch. med. Woch.* 1909, No. 5.

PNEUMOCOCCI (ROEMER). (*See* Serum-therapy.)

POTASSIUM, ACID TARTRATE OF.

Eichhorst[1] has revived an old-fashioned use of this remedy in the treatment of **Cirrhosis of the Liver.** In three cases of severe alcoholic cirrhosis of the liver, with ascites, dyspnœa, and diminished output of urine, after all other methods had failed to give relief, he had recourse to the acid tartrate of potassium. The diuresis increased and the symptoms improved. A similar action was obtained in a number of other conditions in which the usual diuretics failed, and he finds that it increases the rate of absorption of serous pleural effusions.

The good effect of the remedy is not manifested for several days, but, when they commence, continue as long as the administration is kept up. He has never seen any ill effects result from its use, but advises that the following dose should not be exceeded. He makes an aqueous decoction of 180 cc. from 10 grams of marsh-mallow root, and to this adds 15 grams of the potassium salt and 20 grams of syrup. The dose is one tablespoonful every two hours.

REFERENCE.—[1]*Sem. Méd.* Mar. 17, 1909.

PROPÆSIN.

This[1] is the name given to a new local anæsthetic, the propyl ester of paramidobenzoic acid. It is a colourless, crystalline substance, alkaline in reaction, and is only slightly soluble in water, but readily dissolves in alcoholic solutions. It is considered a useful application to mucous membranes, and has been recommended for internal use in **Gastro-intestinal Affections.**

Stürmer and Lüders[2] have used it in the form of pastilles and ointments in painful **Ulceration of the Skin and Mucous Membranes,** and found it specially useful in **Sore Throat** and in **Tuberculous Ulceration of the Larynx.**

REFERENCES.—[1]*N.Y. Med. Jour.* Jan. 30, 1909; [2]*Deut. med. Woch*, 1908, No. 53.

PYOCYANASE.

Trautmann[1] has tested the effect of local application of pyocyanase on **Diseases of the Nose, Throat, and Ear.** His experiences extend over a period of nine months, and were obtained with a series of fifty patients. His general impression is that the preparation is useful. In **Angina** the result was excellent. Within a couple of days the difficulty in swallowing disappeared, membranous sloughs dissolved, and fever diminished. Healing was obtained in from two to five days. The total number of anginous cases was 15 (7 angina simplex; 3 angina follicularis; 2 angina staphylococcica; 2 angina streptococcica, 1 angina streptococcica + bacilli fusiformes). In cases of acute inflammation of the mucous membrane and acute purulent disease of the antrum of Highmore, the healing process was hastened, but pyocyanase seems to be without effect in chronic disease, especially of the middle ear. As a symptomatic treatment it is of some value, lessening the secretions and rendering them more fluid. In **Ozæna** especially the crusts are softer and more easily removed.

REFERENCE.—[1]*Münch. med. Woch.* Mar. 16, 1909.

SABROMIN.

This is the trade name applied to a calcium salt of dibromo-behenic acid with the chemical formula $(C_{22}H_{41}O_2Br_2)_2Ca$. It contains 29 to 30 per cent of bromine, and is a colourless, tasteless powder. According to v. Mering,[1] it is well borne by the stomach, where it is converted into dibromo-behenic acid, a substance which has no action on the

stomach, and is only absorbed after it has passed into the intestine. The drug produces the same effect as the alkaline bromides, the action being less promptly produced; but it is more lasting. Apparently the new drug is as active as the alkaline bromides, though it contains roughly about only half as much bromine. Possibly it is owing to this fact that signs of bromism have never been observed even in animals to which very large doses have been given. Clinically v. Mering considers the drug very suitable for **Hysteria, Neurasthenia, Nervous Excitement, Palpitation, Sense of Anxiety,** and **Nervous Insomnia.** He usually prescribes 1 gram two or three times daily, but has given as much as 6 grams daily over a long period.

Eulenburg[2] has also tested the new drug. His experiences in sixteen cases was very satisfactory. In **Epilepsy** it gave results equal to, if not better than, the alkaline bromides. In five out of six cases it was very satisfactory, but in the remaining two cases it was found necessary to add other bromine preparations. No unpleasant side-actions were noted, and the psychical state remained unaltered. Several of the patients gained in weight. Of the other eight cases of chronic neuroses in which it was tried, it did well in two cases of sexual neurasthenia. It was strikingly successful in a case of psychic depression and in a case of obstinate pruritus, but in the other four it was less successful. He administers the drug an hour after meals, and the tablets should be masticated or broken up in water before being swallowed. It caused no gastro-intestinal irritation or bromism, except in one case, when a slight acne developed.

Kalischer[3] recommends it as a substitute for bromide, as it is tasteless, less likely to produce bromism, and does not disturb digestion. Kroner[4] has also found the preparation a useful substitute for alkaline bromides. It is not irritating to the stomach, and has not even produced acne in his experience with several hundred administrations to some forty patients.

References.—[1]*Med. Klin.* Sept. 20, 1908, in *Brit. Med. Jour.* Feb. 27, 1909; [2]*Med. Klin.* Nov. 8, 1908, in *Brit. Med. Jour.* Feb. 20, 1909; [3]*Deut. med. Woch.* 1908, No. 40; [4]*Ther. d. Gegenw.* Apr. 1909.

SALICYLATE OF SODA.

Haig[1] holds peculiar views on the action of salicylic acid compounds. In acute rheumatic conditions the favourable action of salicylates is almost a certainty, but in chronic disease the salicylates do not always succeed in cases that must be classed as **Acute** or at least **Subacute Rheumatism.** In such cases it is often found that the patient is debilitated, or that the joints are wrapped up in cotton-wool. He considers that the action of salicylates is best accomplished in an acid medium, and that the action of heat and perspiration, by reducing the alkalinity of the blood, diminish the activity of the salicylates. Hence he advises that all measures which diminish blood alkalinity should be avoided. Then keep the patient free from perspiration, do not cover up the joints with cotton-wool, check diarrhœa, and give

acid food. In chronic disease the beneficial action, he holds, is due to the power of salicylates to combine with and eliminate uric acid compounds.

REFERENCE.—[1]*Med. Press*, Nov. 11, 1908.

SANDALWOOD OIL.

Allosan, the allophanic acid ester of santalol, is warmly recommended by Schwersenski[1] as the best derivative of santalol which he has tested. It is a white, crystalline, and stable powder of a mildly aromatic odour. It has no taste, and is absolutely without any irritating action upon the gastro-intestinal tract or kidneys. It does not affect the breath. The santalol portion of the compound begins to be excreted after one to one and a half hours. The allophanic portion after it is split off, immediately breaks up into CO_2 and urea. In doses of 1 gram thrice daily he finds that allosan is similar in action to santalol; that is to say, it does not kill off the gonococci, but is a most useful drug to supplement local treatment. It lessens the secretion, relieves the distressing irritation of acute and chronic gonorrhœal processes, such as **Cystitis, Posterior Urethritis, Prostatitis,** etc. Owing to the utter absence of an unpleasant side-action upon either stomach or kidneys, he considers that it is a distinct advance upon any other preparation of sandalwood oil.

Thyresol.—Thyresol[2] is the methylether of santalol. It is a colourless oil, with the taste and odour of sandalwood oil, but both in a modified degree. In the tissues no santalol is split off. The ether is hydrolysed, and appears in the urine as conjugated glycuronic acid, and very little appears in the urine as resinous acid. It is not split up in the stomach, and therefore is not likely to cause any irritation. Joachim[3] prefers to use the drug in the form of tablets containing 0·25 gram thyresol made up with magnesium carbonate. Two tablets are given three or four times daily. In a large experience with patients of all classes suffering from genito-urinary disease, he found that thyresol was well borne, did not upset the stomach, irritate the kidneys, or affect the appetite, while it exerted the specific action of sandalwood oil, lessening the distressing irritation, and tending to restrict gonorrhœal infection to the anterior part of the urethra, and thereby lessening the risk of complications. At the same time the magnesium carbonate played a useful part in securing an easy movement of the bowels. Richter[4] has also been favourably impressed with thyresol. He treated forty-two cases of gonorrhœa, chiefly among labourers who were unable to lie up. Of these, four were not improved, eleven were cured, and twenty-seven ceased attending because they ceased to feel any discomfort. The complications were not very numerous, but included four cases of epididymitis and five of cystitis. He recommends combining the thyresol with local treatment, as he considers that internal treatment alone cannot cure gonorrhœa.

A more guarded endorsement of the value of thyresol in gonorrhœa is made by Frank.[5] He does not believe that internal treatment will

ever displace local, but considers that the former possesses a certain value. Of all the many drugs he has tried, he finds sandalwood oil the most beneficial, though not wholly free from unpleasant effects. The new preparation he considers an improvement upon the oil. He has given it in gonorrhœa to patients of all ages, and has never seen the slightest ill effect produced by it, and thinks that he can safely state that it is not without action.

References.—[1]*Berl. klin. Woch.* Oct. 26, 1908.; [2]*Apoth. Ztg.* 1908, No. 74 ; [3]*Ther. d. Gegenw.* Nov. 1908 ; [4]*Berl. klin. Woch.* Nov. 9, 1908 ; [5]*Münch. med. Woch.* June 22, 1909.

SCARLET RED.

This aniline dye is a disulphonic acid derivative made from diazo-azobenzoldisulphonic acid and β-naphthol. In the form of a sodium salt the dye is used to stain silk and wool a brilliant scarlet colour. In 1906 Fischer called attention to the fact that, when a saturated solution of scarlet red in olive oil is injected subcutaneously, an inflammatory condition is produced, and also an increase of mitosis in the germinal layer of the skin and in the hair follicles and skin glands. The skin alone is affected, and the new formation of epithelium resembles closely skin carcinoma, but has no tendency for independent aftergrowth, and remains only as long as the injections are kept up. When they are stopped, the new formation retrogrades. Other observers have confirmed this discovery of Fischer. The dye has been used locally to stimulate epithelial growth in **Granulating Wounds** by Schmieden,[1] Kachler,[2] Krajca,[3] and Cernezzi,[4] who all speak favourably of the treatment.

The most recent report is by Davis,[5] based on sixty cases of granulating wounds, mostly among outdoor patients. The test was severe, as the cases were not selected, and for the most part the wounds were very unsatisfactory to start with. Many patients continued at work, so that the factors of rest and daily attendance could not be counted on. The dye employed was that manufactured by the Badische Company, of Ludwigshafen, Germany, which is sold in 1-pound cans, and is inexpensive. In the experiments, he used 2, 4, 5, 8, 10, and 20 per cent scarlet red ointments, with a simple vaseline base. As he had been unable to observe any antiseptic properties in scarlet red, he had the following antiseptic ointments of U.S.P. strength made up in vaseline, and containing 8 per cent scarlet red :— boric, zinc, iodoform, blue, and an ointment consisting of balsam of Peru 1 dr. to vaseline 1 oz. On several occasions he has dusted small wounds with the pure powder. The ointments were prepared by rubbing up the scarlet red with a small amount of olive or castor oil, until a smooth mass resulted, and then this mass was thoroughly mixed with the base. Sterilization of the ointment caused the colour to become somewhat darker, but this change did not seem to affect the stimulating power of the preparation.

Clean, healthy granulations should be bathed with boric solution

and dried. Should the granulations be unhealthy, peroxide of hydrogen is used in addition, before the boric solution. He found it best not to use bichloride of mercury or other strong antiseptic solutions on the wound before treating it with the scarlet red. Free use of nitrate of silver stick is advisable to keep down exuberant granulations. The skin surrounding the defect should be anointed with some bland ointment up to within 1 cm. of the edge. Since this has been done the irritation complained of in some of the early cases has been to a large extent eliminated. The ointment may be applied over the whole surface of the wound if it be small, or simply to the growing epithelial edges. Whichever method is chosen, it is best to apply the ointment on perforated old linen, to which the granulations will not adhere, and which allows the escape of secretions, and thus prevents maceration. When applied to the edges, the old linen should be used in narrow strips covered with a thin layer of the ointment. Another very satisfactory method is to apply a thin coating of the scarlet red ointment to the wound edges with a camel's-hair brush, being sure that the edges are dry. Then either cover with strips of old linen, or expose to the air. This is especially useful in the partial graft cases, and on small wounds, as the ointment can thus be accurately placed and the amount regulated. The portions of the wound not covered by scarlet red may be dressed as seems best, or may simply be exposed to the air under a cage. A light dressing of sterile gauze secured by a bandage completes the procedure. This dressing should be removed within forty-eight hours—twenty-four-hour intervals being preferable—and replaced by some bland dressing, such as zinc or boric ointment. After the same interval has elapsed the scarlet red dressing should be replaced. The importance of careful dressing is emphasized, as in some cases severe irritation has followed the improper application of the dressing. Irritation is more likely where tight bandages are used. It is well to warn patients that the ointment may stain the dressing red. The drug is absorbed and excreted in the urine, staining it bright scarlet.

There were 60 cases treated. Of these 44 were males and 16 females, the youngest being 2 years old, and the oldest 76 years. Duration of the lesions, a few days to 15 years. The cases were grouped as follows: Partial skin grafts, 7 cases; ulcer following operation for infection, 10; ulcer following burn, 11; traumatic ulcer, 10; specific ulcer, 8; varicose ulcer, 7; ulcer following Cotting operation for ingrown toe-nail, 3; bedsore, 2; miscellaneous ulcer, 2. The general health of the patient seems to have some bearing on the stimulating effect of the scarlet red, which is distinctly less marked in nephritic and diabetic cases. The age, on the other hand, has little or no effect.

The rapid-growing epithelium is thick, and at first a bluish-red with an opalescent spreading edge. Venules of considerable size can be seen close to the surface. The colour and the enlarged vessels soon disappear, however, and the newly-formed tissue rapidly assumes the colour and characteristics of the normal skin. There is no tendency

to cicatricial contraction. A section through an area thus healed shows practically normal skin. As a rule, after a short time this skin becomes freely movable over the underlying tissues. Scarlet red should not be used on burns until the irritation has disappeared and the granulations are well established.

The exact strength and combination of the ointment to be used on different types of wounds can hardly be dogmatically stated, as experience is necessary for this knowledge. The 8 per cent ointment is used unless especially contraindicated. In some cases which were sluggish to the 8, the 20 per cent ointment has caused rapid stimulation of the edges. He does not advise the constant use of the 20 per cent strength, as on several occasions it has proved too irritating in spite of all precautions. It is of value now and then, although its action should be carefully watched. On several wounds which were nearly closed, the pure scarlet red powder was dusted on the uncovered area, after protecting the surrounding skin. It had a marked drying effect and caused no irritation. When the wounds are covered with unhealthy granulations, and the discharge is profuse and foul smelling, he found the scarlet red, in iodoform ointment or balsam of Peru or blue ointment very efficacious in cleaning up the granulations, and at the same time stimulating the epithelial growth. A number of large specific **Ulcers,** which had not responded to constitutional or local treatment, were stimulated markedly by scarlet red. Although they were among the most unfavourable-looking ulcers, the healing was prompt and lasting. In the specific cases constitutional treatment was of course continued.

His general impression of the effect of the drug in ulcers is as follows : The stability, thickness, and normal appearance of the healing under scarlet red is noteworthy, and even if the healing in some few instances is no more rapid than that under the ordinary methods, these advantages would seem to make it worth while.

REFERENCES.—[1]*Cent. f. Chir.* 1908, vol. 35, p. 153 ; [2]*Med. Klin.* 1908, No. 22 ; [3]*Münch. med. Woch.* Sept. 22, 1908 ; [4]*Gaz. deg. Osped.* 1909, No. 14 ; [5]*Johns Hop. Hosp. Bull.* June, 1909.

SENNA.

By mixing bismuth with the food, Magnus[1] has been able to follow the effect of senna on the movement of the food along the intestinal tract. He found that it seemed to have no effect upon the stomach and small intestine, but markedly hurried the passage of the intestinal contents through the large intestine. The central nervous system does not play any part, as the effect was as marked after section of the cord at the level of the 11th dorsal vertebra.

REFERENCE.—[1]*Arch. f. d. gesam. Physiolog.* 1908, cxxii. 5–7.

SERUM-THERAPY.

Antirabic Serum.—Marie[1] has used an antirabic serum to shorten the development of immunity. With Pasteur's inoculation treatment immunity is not obtained till about two or three weeks after the

treatment is stopped, whereas with injections of antirabic serum a temporary immunity is immediately obtained. He therefore advocates a combination of serum and Pasteur's treatment as a means of saving even those cases with an incubation period of less than a month. Pampoukis[2] also advises the combination of antirabic serum with Pasteur's active immunity treatment.

Antistreptococcic Serum.—The striking fact that antistreptococcic serum obtained by immunizing horses is without any therapeutic value in man, though affording great protection in many of the lower animals, led Zangemeister last year to suggest that the sera should be tested on monkeys, which are the animals most likely to react like man. His experiments, though limited in number, apparently showed that the horse antistreptococcic sera efficient in mice did not protect monkeys, and he made the suggestion that the amboceptor elements in the horse serum could not combine with the receptor elements in the monkey or human blood. As this theory struck at the very basis of the use of horse sera in human streptococcic disease, Aronson[3] re-investigated this point. His conclusions differ from those of Zangemeister. He prepared antistreptococcic sera by immunizing horses, goats, pigs, dogs, calves, and monkeys, and found that they all protected monkeys against streptococcic infection, while the monkey serum protected mice. He therefore concludes that there is no ground for the suggestion that the horse serum is not efficient in monkeys. Zangemeister,[4] in a subsequent article, criticizes Aronson's results, which he thinks may possibly be due to other factors than the acquired immunity properties of the serum used. In any case, he maintains that whether or not antistreptococcic serum obtained from horses is efficient in conferring passive immunity on monkeys, it is useless in human streptococcic infection.

Cerebrospinal Meningitis.—Holt,[5] using serum obtained from a horse immunized with several strains of meningococci, has apparently met with considerable success. With the head lowered and the hips raised, spinal puncture is performed, and as much fluid is withdrawn as will come away readily. The initial dose of the serum was 30 cc.

The following table shows the mortality at different ages, and the effects of early and late injections :—

Age.	Cases.	Total Mortality.	Injection before 3rd day.	4th to 7th day.	After 7th day.
			Mortality.	Mortality.	Mortality.
0–2 years	59	42·4	0·9 per cent	21·0 per cent	71·4 per cent
2–5 ,,	88	28·4	22·8 ,,	32·5 ,,	27·0 ,,
5–10 ,,	104	15·4	12·3 ,,	12·2 ,,	22·0 ,,
10–20 ,,	149	27·5	24·0 ,,	24·0 ,,	36·6 ,,
20 ,, & upwards	123	39·0	44·5 ,,	37·0 ,,	36·6 ,,

Oral Administration of Sera.—King and McLintock[6] show that it is quite possible to immunize animals with toxins of diphtheria or

tetanus administered by the mouth. Of more importance is the fact that certain antitoxins, notably those of diphtheria and tetanus, can be absorbed from the stomach provided that precautionary measures are adopted to prevent the action of the gastric juice. The most suitable means of accomplishing this is to administer sodium bicarbonate half an hour beforehand. The antitoxin is given mixed with a few drops of saturated solution of salol in chloroform along with a little extract of opium. No food is taken for the next four hours. Using this plan the antitoxin is readily absorbed by children under ten years of age. A further advantage of the oral administration is that the dried form of antitoxin can be used, which keeps better and is cheaper than the fluid antitoxin. The authors have never yet seen any serum disease or anaphylaxis follow the oral administration of antitoxin. In the present state of our knowledge they only advise the oral administration as a prophylactic, but do not think that as a therapeutic measure, oral use should displace the injection application.

Pearson[7] states that all serums are given by the mouth at the East London Hospital for Children, except to cases of very urgent laryngeal diphtheria, when it is given subcutaneously. Children take antitoxin very well when administered with about double the quantity of warm milk. He reports two cases of empyemata associated with *Bacillus coli*, in which the oral administration of anticoli serum had a very marked beneficial effect, while at the same time the bacilli in the discharge became diminished in number, very sluggish, and of large size.

Pneumonia.—Roemer[8] reports on the use of Roemer's pneumococcic serum in 21 cases of pneumonia treated in the Jena clinic. The results seem to have been satisfactory, the mortality being 4·7 per cent. Fourteen of the cases received one injection of 10 cc.; 6, two injections; and 1, four injections. No local reaction was seen, and the injection was always followed by subjective improvement both in the cases where there was lowering of temperature and improvement in the physical signs, and also in those cases where the temperature was only lowered temporarily. In 6 cases the crisis followed the injection, and in 4 a pseudo-crisis. After the injection the temperature fell in two to ten hours from 0·5° to 4° (in 16 cases between 2° and 4°). Except in 6 cases where the crisis appeared, the temperature rose again, but renewed injection produced the same fall of temperature. No rise of temperature or collapse ever followed the injections.' The effect on the local pulmonary signs was very variable. The chief value of the serum is its antipyretic action, which is accomplished without any depression of the circulation, the pulse becoming stronger, fuller, and more regular, and the breathing quieter.

Krische[9] also reports favourably of his experience with this serum in ten cases of pneumonia.

Fresh Horse Serum.—Wirth[10] has used fresh serum in cases of **Severe Bleeding,** with remarkable success. He injected 20 cc. subcutaneously, and when possible applied the serum locally to the

bleeding point. His cases included one of purpura and four of hæmophilia.

Leary,[11] from his experience with a series of 20 cases treated with subcutaneous injection of fresh rabbit serum (less than two weeks old), suggests a wider use of fresh serum in the control of hæmorrhage, and especially the prophylactic use before operations.

Baum investigated the effect of addition of fresh serum on the blood of animals rendered artificially non-coagulable by intravenous injections of *hirudin*. By suitable doses of hirudin he could produce alteration in the clotting time, so that either no clotting at all took place, or else only after a number of hours. In the latter case the addition of fresh serum to the blood always hastened the clotting *in vitro*. But when the hirudin blood did not clot at all, the addition *in vitro* of fresh serum was without any effect on clotting. Similar experimental results were obtained when the serum was injected intravenously before the blood was drawn. In the milder form the clotting time was shortened, but never completely restored to normal, and in the severer type, when the hirudin blood did not clot at all, the injection of serum had almost no action. He was further able to demonstrate that in the hirudinized animals the local application of serum to the bleeding points had no effect in checking parenchymatous or venous oozing. He then tested the effect of serum in three cases of hæmophilia, using the dosage suggested by Weil, viz., 15 cc. of fresh serum for an adult injected directly into a vein, or 30 cc. if given subcutaneously. (The elasticity of the vein prevents any oozing, and blood for examination can easily be obtained by venous puncture without any risk of subsequent hæmorrhage.) The first case was a comparatively mild form in a medical student whose clotting time was about twenty-five to thirty minutes. The addition of 3 drops of fresh serum to 3 cc. of venous blood reduced the clotting time to five minutes. Before the injection of 20 cc. of fresh rabbit serum the clotting time was twenty-one minutes; thirty hours after the injection the blood clotted in a minute. Fifteen days later the clotting time was again thirty minutes. The other two cases were severe forms of hæmophilia in two brothers. In the one case the blood clotted in from one hour and three-quarters to two and a half hours. The addition of fresh serum reduced the clotting time markedly *in vitro* experiments, but the intravenous injection of 10 cc. of fresh human serum had no influence on the clotting time, though the addition of the same serum to the drawn blood reduced the time from two hours to twenty-seven minutes.

Trembur[12] has also found subcutaneous injections of fresh serum of sheep and rabbits of great benefit in a case of severe hæmophilia in a young girl. Local treatment with tampons and gelatin failed to control the bleeding, but the injection of the fresh serum checked it in a few hours.

Lacto-serum.—In an article describing the physiological and therapeutical properties of the serum of milk, Blondel[13] states that

it possesses some very interesting properties. As regards its saline constituents, it behaves like a solution in which chloride of sodium, milk sugar, and phosphates of the alkalies and alkaline earths predominate. But it also contains oxydases or ferments, and thus resembles extracts of animal organs and animal serums. These ferments appear to play an important part when the lacto-serum is injected under the skin. If the lacto-serum is sterilized by heat, the ferments are destroyed and then on injection the effects are simply those of a saline solution; but the injection of lacto-serum sterilized without heat is followed by some novel consequences. "At first there is a slight rise of temperature, coming on soon after the injection and lasting only a few hours. In the next place there is an increase in the polynuclear leucocytes, while there is often a remarkable increase in the excretion of uric acid, especially in febrile cases; finally, as a distinctive and peculiar phenomenon—for those just enumerated belong in common to almost all serums—there is a notable lowering (or what might more correctly be called a "regularization") of the blood-pressure in the arteries and capillaries. This phenomenon is novel and could not have been foreseen, because analysis of the lacto-serum does not reveal the presence of any substance capable of producing such an effect. Neither the very small amount of milk sugar contained in the 10 cc. which I gave as a dose, nor the trifling increase in the amount of urine which might be attributed to it, could be considered as the cause. There is, however, no doubt as to the fact, for a considerable number of observations both on the human subject and on the lower animals have enabled me to prove that when the blood-pressure is increased, either from pathological conditions or artificially, injections of lacto-serum will cause the pressure to fall to normal more or less quickly, and to remain at that level for a time. In cases of hypotension the blood-pressure is not further reduced, but has rather a slight tendency to rise." A case observed in the therapeutic applications showed that a good effect was obtained in twelve cases of *pneumonia*: defervescence always followed the second or even the first injection. The most striking effect was, however, obtained in *arterial hypertension* in *arteriosclerosis*. Out of sixty-three observations one only was a complete failure. In almost all the others there was a fall of pressure, with mitigation of the subjective symptoms: headache, insomnia, general oppression, and breathlessness on exertion. Albumin was almost always slightly increased during the first days of treatment, but if not dependent on organic renal changes it soon disappears.

A daily injection of 10 cc. is given into the muscles of the thigh or under the skin of the flank, and repeated in twenty-four hours until the blood-pressure has fallen to normal. After this the injections are continued for four or five days longer, and then a weekly injection is given for a month, with more frequent repetitions if the pressure rises. When the pressure remains normal, a monthly injection is given for three months. The injections are not repeated unless the

symptoms of hypertension recur. Lacto-serum may be prepared by coagulating absolutely fresh milk with a few drops of HCl, removing the curd by filtration through muslin, neutralizing the liquid with Na_2CO_3, and finally filtering through a d'Arsonval bougie. This process is tedious, and rennet coagulation is better. Coagulation of the milk by means of some drops of rennet (*présure*), sterilized by filtration and with its action strengthened by a trace of chloride of calcium, produces a better curd, leaves no albuminous substances in the whey, does not form peptone, interferes less with the oxydases, and secures a more rapid filtration; but it requires the liquid to be made isotonic by the addition of a little chloride of sodium, in order that the injection may not be painful. The lacto-serum is preserved in flasks hermetically sealed after being filled with carbonic acid gas. Under these conditions it may retain its activity for one or two months, or even longer.

Auto-serotherapy.—Schnützen[14] has tested this treatment with fairly satisfactory results as regards the absorption of fluid exudate in cases of true *pleurisy*, but says it is without effect in cases of hydrothorax, ascites, and commencing empyemata. Auto-serotherapy consists in withdrawing a syringeful of the pleuritic fluid and immediately injecting it under the skin. No local reaction or constitutional disturbance is produced, but the pleural effusion is rapidly absorbed. In slight cases of pleurisy a single injection is sufficient, but repeated injections may be required in severe cases. He treated fifteen cases, with only one unsuccessful result. Immediately after the injection there is marked diuresis.

Enriquez[15] was also favourably impressed by the results obtained in treating three cases of pleurisy with effusion. In a recent paper Gaultier[16] gives his experience with this method, and concludes: Auto-serotherapy seems efficacious. It is easily performed, does no harm, and can be used not only in serofibrinous pleurisies of tuberculous origin, but also in pleurisy with effusion of other origin. The beneficial action is more prompt in acute than in chronic cases. The quantity of fluid to be injected varies from 2 to 3 cc. in the acute cases to 4 to 5 cc. in the chronic. The action is not due to the removal of fluid, but to the injection of this small quantity of fluid under the skin. The injections only produce a reaction with some fever in tuberculous pleurisy, which may be used as a diagnostic sign. The effect of the injection is shown by a great increase in diuresis.

Serum-therapy in Chlorosis.—A new method of treating chlorosis is suggested by Deléarde and Paquet.[17] After an animal is bled, the volume of the blood is soon made up, but the corpuscles and hæmoglobin require longer time for complete restoration. If during this regenerating period the serum be injected into another animal, it rapidly causes a considerable increase in the number of red corpuscles. Similarly antidiphtheritic horse serum possesses this stimulating property, as the horse is repeatedly bled during the preparation of the antitoxin. They have tested the effect of injections of such serum

in anæmic children, and claim to have obtained a rapid and marked rise in the number of corpuscles. The same effect is obtained if the serum is given by the mouth. A similar effect in stimulating the regeneration of blood was noted by Deflandre[18] in women anæmic from menorrhagia. Whereas without treatment their blood took fifteen days to regain the normal, with daily injections of 2 to 4 grams of dried serum, the blood became normal in one week.

REFERENCES.—[1]*Ann. Past.* t. xxii. p. 270; [2]*Deut. med. Woch.* 1908, No. 48; [3]*Berl. klin. Woch.* 1909, No. 15; [4]*Ibid.* May 17, 1909; [5]*Jour. Amer. Med. Assoc.* Feb. 6, 1909, in *Ther. Gaz.* 1909, p. 345; [6]*Jour. Infect. Dis.* Feb. 18, 1909; [7]*Brit. Med. Jour.* July 10, 1909; [8]*Jena Dissertation*, in *Edin. Med. Jour.* June, 1909; [9]*Med. Klin.* in *Edin. Med. Jour.* June, 1909; [10]*Wien. klin. Woch.* 1909, No. 3; [11]*Bost. Med. and Surg. Jour.* 1908, iii. 73, in *Amer. Jour. Med. Sci.* Nov. 1908; [12]*Mitteil. a. d. Grenzgeb. d. Med. u. Chir.* 1909, Vol. xx. Hft. 5; [13]*Lancet*, Apr. 10, 1909; [14]*Berl. klin. Woch.* Jan. 18, 1909; [15]*Soc. Méd. d. Hôp. de Paris*, June 4, 1909; [16]*Bull. Gén. de Thér.* Sept. 8, 1909; [17]*Echo Médic.* May, 1909, in *Edin. Med. Jour.* 1909, p. 589; [18]*Progrès Méd.* Feb. 13, 1909, in *Edin. Med. Jour.* 1909, p. 589.

SODIUM CHLORIDE

R. von den Velden[1] claims that sodium chloride administered per os in doses of from 5 to 13 grams augments the coagulability of the blood. He has made use of this property of the drug in the treatment of **Internal Hæmorrhage.** It acted well in twenty-nine cases of **Hæmoptysis.** In these cases not more than 5 grams should be given to prevent irritation of the stomach or diarrhœa. The increased coagulability of the blood lasts from several minutes up to an hour and a half, at the end of which time the bleeding may begin again. In such cases he gives a second dose of sodium chloride, or instead 3 grams of sodium bromide, which has a similar action, and in addition acts as a general sedative. In many cases he alternately gives the chloride and bromide, using 20 to 30 grams of the chloride and 12 to 15 grams of the bromide each day. In rupture of a large vessel it may be necessary to continue the treatment for two or three days before the bleeding definitely ceases. The treatment may also be applied in other forms of hæmorrhage, e.g., **Cholæmic Epistaxis,** and in **Hæmophilia.** He has also had good results in bleeding from the bladder due to hypertrophy of the prostate. When treatment by the mouth cannot be used, he injects the drug directly into the vein, using 3 to 5 cc. of a sterilized 10 per cent solution of NaCl. He recommends this method where a very rapid action is desirable, or when it is necessary to avoid the stomach, as in ulceration of the intestine or stomach. He has successfully used these intravenous injections in seven cases of hæmoptysis, and one case each of severe intestinal hæmorrhage in typhoid fever, bleeding from a varicose condition of the œsophageal veins, and varicose bleeding of the bladder.

REFERENCE.—[1]*Sem. Méd.* Feb. 10, 1909.

SPIROSAL.

According to Lehmann,[1] spirosal can be used as a local application for **Rheumatic Disorders.** Mixed with equal parts of alcohol it is unirritating to the skin and is easily absorbed. He recommends the local applications in subacute afebrile forms of rheumatism.

REFERENCE.—[1]*Berl. klin. Woch.* Apr. 12, 1909.

SULPHONAL.

It is well known that the continuous use of sulphonal occasionally is followed by a serious train of toxic symptoms, which not infrequently prove fatal. Talley[1] points out that in a few cases the toxic symptoms appear after a few doses, while in other instances the drug has been administered for months or even years before any manifestation of poisoning is seen. He records a case known to him in which a woman has used sulphonal continuously for twelve years without apparently suffering any harm, though he calculates that she has been taking about half a pound of sulphonal each year for this prolonged period. This case of course only shows that this individual's power of resisting the toxic action is exceptional, and does not remove the necessity for carefully observing any patient who is taking sulphonal for a considerable time. A case is already on record, in which fatal toxic symptoms appeared after the continuous use of the drug for six years in doses of from 20 to 40 gr. The appearance of even the first symptom of poisoning is of moment, since we have no certain means of checking the development. The symptoms are pretty uniform in all the well-developed cases of poisoning. They consist in epigastric pain, nausea, vomiting, acetone odour in the breath, usually constipation, low temperature, shallow respiration, feeble pulse, cyanosis, scanty dark reddish urine due to hematoporphyrin, which may or may not contain albumin, casts, degenerated blood corpuscles, and much urobilin; ataxia, delirium, or stupor, gradual development of motor and sensory paralysis, and finally death, usually from respiratory, sometimes from cardiac arrest. A point in prognosis is the observation that all the cases that have recovered have had some or all of the gastro-intestinal, nephritic, respiratory, and circulatory symptoms, but no nervous symptoms beyond stupor and ataxia. The development of paresis appears always to run on to complete paralysis and death. The predominance of constipation among the toxic cases should put one on the alert to keep the bowels active during the exhibition of the drug, but free purgation is not able to eliminate the poison when once absorbed.

REFERENCE.—[1]*Amer. Jour. Med. Sci.* Oct. 1908.

SULPHUR.

Heubner[1] advocates sulphur waters for children in a **Chronic Catarrhal Condition** affecting the mucous membrane of the pharynx, retropharynx, and base of the tongue. This produces a syndrome characterized by persistent loss of appetite, a tendency to vomit

readily, the breath is malodorous, and the throat, especially in the morning, is coated with tenacious mucus. This condition is rebellious to other forms of treatment, but yields to a course of sulphur water. He finds no difficulty in getting the child to take a wineglassful of the water (cold) before rising, and repeating this dose twenty to thirty minutes before breakfast. The course of treatment lasts from four to six weeks.

Colloidal Sulphur.—According to Sabbatani,[2] colloidal sulphur has no special pharmacological properties differing from those of ordinary forms of sulphur, but is much stronger in its action. This is in accord with the fact that in every form the more fine the state of division the more active is the preparation.

On the other hand, Nevinny[3] claims that there is a difference between the effect of a colloidal preparation, sulphidal, and precipitated sulphur. He has carried out a number of comparative experiments between the two forms, and the following are some of the more important distinguishing properties. Colloidal sulphur does not, in contact with egg albumin, form H_2S so readily as precipitated sulphur. 100 grams egg albumin form with sulph. præcip. 2·39 mgrams H S; with sulphidal 1·50 mgram H_2S. The same inhibiting effect on the production of H_2S seems manifested after sulphidal is swallowed. He found that when he took sulphidal the smell of H_2S in the flatus took much longer to appear than when the precipitated sulphur was taken. On the other hand, the laxative action of sulphidal is apparently greater than that of precipitated sulphur. With Nevinny 0·1 gram of sulphidal produced a laxative action, whereas he required 0·3 to 0·5 gram of sulphur præcipitatum. Metabolism experiments on dogs indicate that no effect is produced on the N excretion by either form of sulphur. He also investigated the excretion with the two forms administered by the mouth, and found that the absorption (11 per cent) of sulphidal was more constant than that of sulph. præcip. (8 to 20 per cent). Further, after sulphidal the sulphur is not excreted in the urine in the form of neutral sulphur, but seems all to be oxidized, and appears as sulphate. With sulph. præcip. all the sulphur is not oxidized, and a large proportion appears in the urine as neutral sulphur. He interprets this as indicating that sulphidal is more thoroughly utilized than precipitated sulphur.

REFERENCES.—[1]*Ther. Monats.* 1908, No. 12, in *Jour. Amer. Med. Assoc.* Jan. 23, 1909; [2]*Arch. Internat. de Pharm. et de Ther.* Bd. xviii. p. 375; [3]*Berl. klin. Woch.* 1908, Nos. 42 and 43.

THIOSINAMINE, FIBROLYSIN.

Tyrode[1] has investigated the action of this drug on rabbits, guinea-pigs, and frogs, but can find no explanation of its alleged solvent action on cicatricial tissue. In warm-blooded animals thiosinamine does not depress the circulation, but may cause death through respiratory failure. He noticed a profound change in metabolism, consisting in rapid loss of weight, with increased proteid combustion

and general fatty degeneration of the different parenchymatous organs, especially heart and kidneys. This fatty degeneration may come on early, even after only six days' use of the drug. Only the epithelial cells are affected, and no change in the connective tissue of these organs could be detected.

Charteris[2] has tested the effect of thiosinamine on the blood of patients and healthy men receiving it by the mouth or by injection. He was unable to detect any marked action. Introduced in glass capillary tubes into the peritoneum of frogs, it did not produce a local accumulation of leucocytes, and in man the prolonged use of the drug caused no definite increase in the number of the leucocytes in the peripheral blood, nor materially affected the differential leucocyte count. He also states that in his experience the drug is of no value in overcoming the ankylosis of chronic arthritis or stiffness following injury to joints. The adhesions were in several cases broken down under chloroform, but despite the use of passive movement and massage, the joints soon became stiff again, though fibrolysin was steadily administered. Gettings[3] had an exactly similar experience with a hæmophilic knee in which the prolonged use of fibrolysin injection failed to improve the movement. On the other hand, Bannatyne[4] states that he has used fibrolysin with great success in the treatment of **Deformities and Contractions** arising from chronic joint conditions. The large majority of his cases were rheumatoid ones, in which there had been great deformity and stiffening of the joints with muscular contraction. He has not found it of use in acute cases. The dose is 2·2 cc. injected twice a week into the subcutaneous tissue of the arm, leg, or loins (it is not advisable to inject near a joint). No improvement is seen till four or five injections have been given, and it is necessary to give from thirty to forty injections in all. He combines this treatment with baths, massage, etc. It is not suitable for acute cases, or where the disease is spreading, but gives benefit in quiescent or cured cases where much deformity and stiffening remain.

Strong,[5] of Melbourne, has also had good results in various forms of **Fibrous Contractions,** including a case of chronic rheumatoid arthritis and one of gonorrhœal arthritis. He combines the injections with local treatment, massage, etc.

Mendel[6] warmly recommends a 10 per cent fibrolysin plaster as a local application for superficial **Keloid Growths.** After cleaning the skin with ether or benzine, a piece of the plaster slightly larger than the keloid is applied, and renewed after twenty-four hours. It seldom causes any irritation. He found it very useful for healing the keloid growths which occur after extirpation of tuberculous glands. Old keloid growths can be excised, and with local prophylactic application of the plaster no recurrence is seen. This plaster has also proved serviceable as an application to corns and warts. He warns most emphatically that the local action of thiosinamine in cicatricial tissue is often very slow, and requires great patience on the part of patient

and medical man. The fibrolysin plaster is also used by Immelmann[7] in cases of chronic **Röntgen-ray Dermatitis.**

REFERENCES.—[1]*Bost. Med. & Surg. Jour.* in *Ther. Gaz.* 1909, No. 2; [2]*Brit. Med. Jour.* Aug. 28, 1909; [3]*Ibid.* Sept. 25, 1909; [4]*Lancet*, Jan. 23, 1909; [5]*Ibid.* Aug. 21, 1909; [6]*Ther. d. Gegenw.* July, 1909; [7]*Münch. med. Woch*, 1909, No. 18.

THIOZONE.

This is a new compound rich in triatomic sulphur. It is a solution of sodium linalylacetatthiozonide in sodium thiozonate. It is a blackish-brown, syrupy fluid of pleasant odour. Nagelschmidt[1] has used it in the form of an ointment containing 10 parts thiozone made up with 60 parts palmseed oil and 20 parts each of lanolin and vaseline. It does not irritate the skin. A single application of 50 grams of this ointment cures **Scabies.** It is also useful in the form of a bath; 50 grams dissolved in warm water cause a milky turbidity, but the odour is pleasant, resembling lavender, and the medicine does not attack the bath. After using the bath or ointment, absorption is proved by an increase in the excretion of sulphates.

REFERENCE.—[1]*Ther. Monats.* 1908, No. 10, in *Münch. med. Woch.* Dec. 1, 1908.

THORIUM.

In recent years a number of cases have been reported in which the use of bismuth salts for facilitating **X-Ray Examination** have been followed by poisoning. As a suitable substitute Kaestle[1] suggests the use of anhydrous thorium oxide. It is a fine, white, heavy powder, which is not affected by acids or alkalies. It throws a very dense shadow, as it possesses great power of absorbing X rays. Without any pharmacological action on the body, it passes through the intestine unchanged. It has no taste, and can readily be administered in the form of a thick emulsion or mixed with food, but is too heavy to give with water alone. Unfortunately the cost of the drug is considerable, but it appears to be indicated wherever bismuth has caused any disturbance. (*See also* RADIUM and RADIOGRAPHY, *pp.* 116, 122.)

REFERENCE.—[1]*Münch. med. Woch.* 1908, No. 51.

THYMUS GLAND.

Nathan[1] has had uniformly good results with the use of thymus gland in metabolic **Osteo-arthritis.** In children, good results were obtained when the disease was either associated or not with enlargement of the glands and spleen. In adults the effect upon the nutrition is very marked. The patients soon take on flesh and gain in muscular power, the improvement being more rapid and definite in the earlier stages of the disease. The thymus is given in 5-gr. tablets thrice daily. After two weeks the dose is increased to 3 tablets t.i.d., and after a few months three tablets four times a day are given. He does not consider the thymus a specific, but thinks that it acts as a stimulant to the nutritive processes, and probably in a measure counteracts the deleterious influence of the causative condition.

REFERENCE.—[1]*Amer. Jour. Med. Sci.* June, 1909.

THYMUS SERPYLLUM (Wild Thyme).

Ziachenko[1] recommends infusion of wild thyme in **Respiratory Infections of Children.** For children of one year, 0·5 gram, and for older children up to 1·2 gram, is infused with 100 parts of water and given during the twenty-four hours. He finds it useful in all forms of spasmodic cough, especially whooping-cough during the acute stage, when the spasms are severe, with little sputum, and in the dry, nervous forms of asthma.

REFERENCE.—[1]*Sem. Méd.* Mar. 31, 1909.

THYROID PREPARATIONS.

Reed Hunt and Seidell[1] believe that the various commercial preparations of thyroid vary considerably in strength, and they make some suggestions for a more satisfactory standardization. The most characteristic constituent of the thyroid is iodine, present in a peculiar and unknown form of combination. The question has often been raised whether the amount of iodine present can be taken as an index of the activity of the thyroid. Though different answers have been given by different observers, on the whole the evidence points to the conclusion that the iodine content and the activity of the thyroid are generally parallel. One of the chief difficulties has been the lack of an easy and accurate method of testing the physiological activity of thyroid preparations. They believe that they have found such a method in the effect of thyroid feeding on the resistance of animals to certain poisons, chiefly acetonitrile and morphia. With this test they found that iodine-free thyroids had a low degree of physiological activity, while the presence of even a small amount of iodine (in proper combination) markedly increases the physiological activity of the thyroid gland. Within certain limits the amount of acetonitrile which the organism can neutralize as the result of thyroid feeding is directly proportional to the percentage of iodine contained in the thyroid. By feeding dogs with iodide of potassium or iodoform, they were able to increase the iodine content of the thyroid gland two and a half to three times that of controls, and the physiological activity was correspondingly two to three times as great. Unless the thyroid iodine is present in the special form of combination the activity is not increased. Thus it is possible to add iodine to the thyroid or its colloid *in vitro* without intensifying the physiological activity. They think that in commercial preparations of high iodine content but low physiological activity, some decomposition has taken place, so that the iodine is no longer in proper combination. Their analyses show that the iodine content of desiccated sheep thyroid varies; in commercial thyroid powder the percentage ranged from 0·1 to 0·2, while tablet preparations showed greater variation, viz., from 0·084 to 0·32. If the iodine content is accepted as an index of activity, some commercial thyroid preparations must be from two to four times as active as others. A further element of uncertainty arises from the fact that a 5-gr. thyroid tablet with some manufacturers means

a tablet of 5 gr. containing thyroid, while with others it means a tablet containing 5 gr. of thyroid. They examined three samples of iodothyrin, but found that though the percentage of iodine contained was the same, the form in which it occurred was various; one gave no reaction for loosely combined iodine, another only a moderate reaction, but the third gave the reaction very strongly. Evidently decomposition had taken place to a varying extent, and the physiological activity varied, the last two being three times weaker than the first.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Oct. 24, 1908.

TIODINE.

Tiodine is thiosinamine-ethyl-iodide. Murrell[1] states that he has been using it for some time in various **Chronic Scleroses of the Cord.** It is slow in action, and it is hopeless to expect any very striking result unless the patient is willing to submit to a four to six months' course of treatment. For this reason his hospital cases have as a rule been imperfectly healed, in one well-marked case of disseminated sclerosis the patient remained in hospital for five months, and received during this time 168 injections, each of 0·20 cgram, with extremely favourable results, as the symptoms entirely disappeared. The progress of the patient was one of uninterrupted recovery almost from the first. From Nov. 7th to Feb. 9th she received injections daily, after which they were given twice a day, with occasional omissions. The injections were usually given into the buttocks or abdominal wall. There was no reaction, though each injection produced a hard subcutaneous nodule somewhat smaller than a pea, but they did not suppurate. Knopf,[2] on the other hand, has not noticed any definite benefit in locomotor ataxia from the use of tiodine.

REFERENCES.—[1]*Med. Press*, May 5, 1909; [2] *Wien. klin. Woch.* 1908, No. 36.

TRICHLORACETIC ACID.

When cut tissues are smeared with a concentrated solution of trichloracetic acid, the albumin is coagulated, and a white film of acid albumin forms which acts as an antiseptic medium in which bacteria cannot develop. The action is limited to the part painted. The application of the acid is warmly recommended to prevent **Secondary Hæmorrhage** and **Infection of Wound or Stitch Openings** in operations about the rectum and vagina, and in throat and nose work. In operating on hæmorrhoids the use of trichloracetic acid seals the wound and the stitch openings for four to six days. Infection of the sutures is prevented, the wound heals readily, and the sutures are absorbed. It is very useful in perineoplasty and allied operations used as a 50 per cent solution.

REFERENCE.—[1]*Wisconsin Med. Jour.* Dec. 1908, in *Ther. Gaz.* Apr. 1909.

TRYPSIN.

Jochmann[1] has found that the polymorphonuclear leucocytes contain a proteolytic ferment not present in lymphocytes. This ferment he thinks is of some importance. Owing to the absence of polymorphs, **Cold Tuberculous Abscesses** contain no ferment, but it has been found that the addition of a proteolytic ferment to the contents of the abscess hastens the absorption of the tuberculous exudate, probably by the digestion of the albuminous contents. In his original experiments Jochmann found that a ferment extracted from polymorphs, spleen, or bone marrow, injected into the abscess cavity caused more rapid absorption of the exudate, but he has given up this form of extract, as he finds that trypsin possesses the same action. He now uses a solution containing 1 part of trypsin in 100 parts of sterile physiological saline solution, to which 0·5 per cent phenol may be added. To ensure that sterility is complete, the solution is filtered and plated. Working with Baetzner,[2] he has investigated the clinical effect of trypsin in cold abscesses and other forms of tuberculous disease, e.g., of glands, ulcers, ganglions, bones, and joints. The trypsin solution is used locally in doses of 1 to 2 cc. It does not affect healthy tissue, owing to the presence of antitryptic antibodies, but acts on tuberculous tissue, attacking and digesting it. The healthy tissue responds with an increased formation of healthy granulation tissue. The trypsin solution is well borne, causing slight burning pain but no general reaction. Injected into tuberculous abscesses, the effect is as follows : The purulent content alters in colour and consistence, cellular elements diminish, and the pus changes to a brown syrupy fluid, which then becomes thin and serous. From the circumference healthy granulation tissue appears, filling up the original abscess cavity. When applied to purulent fistulæ connected with diseased bone or joints, the effect of the trypsin is shown in diminution in the secretion, which becomes thin and serous. In ganglions, with typical rice-body formation, the trypsin injections give very good results. The creaking is lessened after a few injections, the tumour becomes smaller, and the tendons act better, eventually all that remains of the disease being a tough infiltration of the wall of the synovial sheath.

The healing action in these forms of tuberculous disease is perhaps of a double nature. In addition to the proteolytic action on the tuberculous products there is a stimulating action on the healthy tissue, resulting in the formation of fresh granulation tissue. Goldenberg suggests that sodium nucleinate injected into a cold abscess may attract polymorphonuclear leucocytes, and that subsequent treatment with Röntgen rays may be used to destroy the leucocytes and set free their ferment.

In acute abscesses trypsin cannot be used, but possibly antitryptic substances may do good. Owing to the presence of polymorphonuclear pus cells, probably too much ferment is present, which causes local damage to the tissue and keeps up the irritation, causing further accumulation of leucocytes. On these theoretical grounds Müller and

Preiser[3] suggested for acute abscesses the local application of fluid containing large quantities of the trypsin antibody, e.g., ascitic or hydrocele fluid. This theory has been tested in all forms of acute abscess. Circumscribed abscesses are aspirated, and a small quantity of the antiferment-containing fluid is injected. In other instances, the abscess is opened and the antiferment fluid is applied on tampons or as an injection. In either case the pus rapidly disappears and is replaced by a clear fluid, and healing is rapid. The chief domain of the antiferment treatment is in definitely circumscribed abscesses. It is of no use in infiltrating suppurative processes, as boils or carbuncles, burns, or phlegmons of fingers or tendon sheaths, owing to the difficulty of bringing the antiferment fluid into contact with the walls of the diseased tissue.

Fuchs[4] has used the antiferment treatment in a small series of **Suppurating Gynæcological Wounds** with success. The fever promptly fell, probably owing to the antiferment stopping any further splitting up of the albuminous substances, thus preventing the absorption of fever-producing substances. The purulent secretions rapidly diminished and became serous, but the chief benefit appeared to be that there was no further destruction of tissue.

REFERENCES.—[1]*Munch. med. Woch.* Jan. 5, 1909; [2]*Ibid.* Dec. 1, 1908; [3]*Ibid.* 1908, No. 17; [4]*Centr. f. Gyn.* 1909, No. 9.

URIFORM.

Uriform[1] is a compound elixir of hexamethylene-tetramine-santal and saw palmetto with some nux vomica, and is made up with an alcoholic menstruum. It is suitable for **Genito-urinary Infections,** and is a palatable form for administering hexamethylene-tetramine.

REFERENCE.—[1]*Amer. Med.* Nov. 1908.

UROTROPIN.

Crowe[1] points out that urotropin is found in the cerebrospinal fluid after it is administered by the mouth, and he has carried out a number of observations on human patients to determine the practical antiseptic value of the urotropin in the cerebrospinal fluid. His conclusions are as follows: (1) Urotropin, when given by the mouth, invariably appears in the cerebrospinal fluid. This fact has been demonstrated by a large number of observations on man, and is also true for dogs and rabbits. (2) The largest amount of urotropin is present in the cerebrospinal fluid from thirty minutes to an hour after the ingestion of the drug. (3) After doses of urotropin, within therapeutic limits, a sufficient amount of the drug appears in the cerebrospinal fluid to exercise a decided inhibitory effect on the growth of organisms inoculated into this fluid after its removal from the body. (4) Following a subdural inoculation of dogs and rabbits with streptococcus, 60 to 80 gr. of urotropin a day, given under conditions which insure absorption, will markedly defer, and in some cases prevent, the onset of a fatal meningitis. (5) In view of these observations, the prompt

administration of urotropin is advised in all clinical cases in which **Meningitis** is a possible or threatened complication, or even when meningeal infection has actually occurred.

REFERENCE.—[1]*Johns Hop. Hosp. Bull.* Apr. 1909.

VACCINES.

The estimation of the opsonic index is a distinctly troublesome procedure which requires considerable technical dexterity, and more time than the average general practitioner can afford. It is, therefore of great importance if vaccine treatment is to maintain its popularity, that other methods than the opsonic index of controlling the effect of our inoculations must be adopted. In an interesting paper, Matthews[1] indicates how this may be carried out in certain types of infection commonly treated with vaccines. The majority of cases treated by the vaccinator are strictly localized, acute or chronic. In such the production of a temporary negative phase is of little moment, provided that it is followed by a more or less prolonged positive phase. In most cases the negative phase should not last more than twenty-four hours, during which time it may evidence itself in an increase in the subjective and local objective symptoms. Among the subjective symptoms are malaise, increased tenderness, and pain at the site of the lesion, and, in bladder cases, increased frequency of micturition. Objectively there may be some or all of the following: increase of discharge, swelling, and congestion, and, in the case of acne and similar generalized local infections, an increase in the number of foci of infection; and in bladder cases, perhaps more cloudiness, due to increased activity of the infective microbe. But such increase in the symptoms and signs should only last for about twenty-four hours, and should then be followed by an amelioration. Should any of the negative signs be severe, the dose on subsequent occasions should be reduced. Immediate improvement in suppurating acne means that the dose is too small. An appropriate dose is followed by a temporary exacerbation of the signs, lasting for twenty-four hours, after which amelioration occurs. If the dose is too small, immediate amelioration is seen, but is short-lived. With too large a dose a negative phase of several days is seen, during which period the lesions get worse, and only slowly get back to the condition before the inoculation. In addition to staphylococcic lesions, vaccine treatment without opsonic indices may be applied in some cases of tuberculous, streptococcal, and gonococcal lesions, as well as in the preventive inoculation of enteric fever.

In streptococcic disease, the dose should be small in local primary infectious cellulitis, lymphangitis, and erysipelas, and here the ready response of the local condition can guide us. In secondary streptococcic infections, especially those connected with tubercle, as an infected lupus or tuberculous sinus, the condition is very chronic and sluggish, and larger doses may be used. In gonorrhœal arthritis, excessive dose is indicated by increased pain and stiffness, and possibly

general malaise. With urethritis the negative phase is shown by an increase in the gleet, and if this increase lasts but one day, a good result from that dose may be expected.

He summarizes the essential points in the class of case when clinical signs afford evidence as to the appropriateness or otherwise. A dose of vaccine may be considered as appropriate when any negative phase, as indicated by objective or subjective signs, is only temporary and is followed by a longer or shorter period of improvement. Up to a certain point the period of improvement is proportional to the duration of the negative phase; but a point is soon reached when no improvement beyond the pre-existing condition is obtained. Beyond this point, a dose may be considered to be excessive. Conversely, if a short period of improvement with no signs of an intervening negative phase occurs, the succeeding dose of vaccine may be cautiously increased. As regards staphylococci, the only exceptions to the above broadly-stated rule would appear to be infective endocarditis and septicæmia, which are occasionally caused by staphylococcus. In such cases it would hardly be proposed that opsonic indices should be dispensed with; but were these latter out of the question it is obvious that extremely small doses should be given, though it might be advisable to repeat them with more than usual frequency, even to daily doses. Practically, the only guide in such cases, beyond the conditions of any local lesion that might be present, would be the temperature. This, however, has been in some cases very valuable, indicating fairly accurately the state of resistance of the blood. Roughly, the temperature rises with a lowering of the opsonic index, and vice versa.

The most common form of tuberculous disease to be treated with inoculation is enlargement of glands. The effect of a suitable dose should produce no marked change in the local symptoms, so that the dose used cannot be checked by its effect on the clinical signs. Previous experience shows that the dose should differ for cases of merely local glandular infection, and for those severer cases where there is tuberculous disease elsewhere. For a robust adult with strictly localized glandular mischief, from $\frac{1}{1\,5\,0\,0\,0}$ to $\frac{1}{1\,0\,0\,0\,0}$ mgram of T.R. may be given as an initial dose, but when there is evidence of tuberculous disease elsewhere, not more than $\frac{1}{2\,0\,0\,0\,0}$ to $\frac{1}{3\,0\,0\,0\,0}$ should be given. The dose may be repeated not more frequently than every tenth day, and may be gradually raised every third dose till $\frac{1}{5\,0\,0\,0}$ to $\frac{1}{4\,0\,0\,0}$ mgram. is given. Lupus stands tuberculin well as a rule, but there is rarely occasion to give a dose as large as $\frac{1}{2\,0\,0\,0}$ mgram. Cases of genito-urinary tuberculosis do not stand large doses as a rule, and $\frac{1}{5\,0\,0\,0}$ mgram should be regarded as a maximum.

Latham has also been interested in this question of obtaining a simpler guide than the opsonic index, and has carefully studied the opsonic curve side by side with the temperature curves and clinical characteristics of the case in order to see whether any relationship existed between the opsonic index and the temperature on the one hand, and between the opsonic index and the clinical symptoms on

the other. The general result of this work is satisfactory. In a paper by Inman and Latham,[2] it is shown that a real relationship exists between the opsonic index and the temperature and clinical condition in tuberculous disease. In a subsequent paper,[3] Latham states that the same relationship holds good in pneumococcic, staphylococcic, *Bacterium coli*, gonococcic, and *Micrococcus catarrhalis* infections. It is possible to determine the immunizing response of the blood without estimating the opsonic index, by a close study of the temperature curve and the clinical symptoms of a case. When the temperature rises the opsonic index is falling, and vice versa. This is true, not only for febrile temperatures, but also for subnormal ones. Again, an increase in the daily swing of temperature means a falling opsonic curve; whereas a diminution of the daily fluctuation means a higher level of the opsonic curve. Thus a dose of tuberculin which causes a higher temperature or a greater swing is doing harm, and is therefore too large. A lowering of temperature or lessening of the swing (a flatter temperature) means that the dose is doing good. Too small a dose has no effect upon the temperature one way or the other. Similarly, improvement in the physical signs or symptoms is associated with a rise of opsonic index, and when the symptoms or physical signs are showing an extension of the disease, the opsonic curve is at a lower level. An excessive dose of tuberculin in the case of glandular disease will be followed by such symptoms as a peculiar headache just above the eyebrows, restlessness, want of appetite, pain in the glands, or enlargement or temporary swelling of the glands. These symptoms are coincident with a falling index. An effective dose leads to the patient feeling better, and to an improvement in the symptoms which is coincident with a rising index. In most cases, therefore, a close study of the temperature and the clinical symptoms enables us in tuberculin therapy, and so far as his experience goes, in other forms of vaccine therapy, to obtain sufficient knowledge of the immunizing response of the blood to enable us to determine our doses and the spacing of these doses, without resorting to the laborious technique of the opsonic index.

In treatment of tubercle he finds that T.R. given by the mouth on an empty stomach is absorbed as accurately as by the skin. The dose by the mouth (equivalent to about half the same dose injected) is best given in one or two ounces of tepid milk before breakfast. In a comparatively early case of tuberculous glands without secondary infection, he adopts general hygienic measures, and has the temperature carefully recorded for a week. He commences with a dose of tuberculin by the mouth which can do no harm, say $\frac{1}{50000}$ mgram, and then at 48-hourly intervals increases it till it produces a definite effect upon the temperature, e.g., lowers it or reduces the daily fluctuation. As soon as this effect wears off, the same dose is repeated as long as it produces this action. Any dose raising the temperature is too large. Attempts to hurry the treatment do harm.

Numerous clinical reports have appeared recording successful

administration of vaccines. Among the more unusual cases is that of severe **Facial Carbuncle,** with **Ludwig's Angina** and **Parotitis,** reported by Walters, Coombe, and Solly,[4] which recovered under staphylococcic vaccine and repeated doses of citric acid.

Of more general interest is the attempt to treat **Pneumonia** with vaccines. Butler Harris[5] concludes that inoculation does no harm, and that successful inoculation for the cure of pneumonia is possible. He advises as early inoculation as possible. A vaccine from one or a number of virulent strains, not necessarily autogenous, may be used. It is unnecessary to estimate the opsonic index, as the temperature and physical signs are sufficient guides. Pneumococcic infections of the lungs which fail to resolve after acute attacks, and pneumococcic infection elsewhere, should receive vaccine treatment. Willcox and Parry Morgan[6] also discuss the treatment of pneumonia by inoculation. It is not intended to replace the usual therapeutic measures, but is a very valuable additional therapeutic measure, which in many cases gives striking benefit and has never in their experience done harm. To obtain an autogenous vaccine, cultures may be made from the spit, blood, or by aspirating the pleural cavity or superficial part of the lung over the area of greatest consolidation. The last method is the quickest. The dosage of the autogenous vaccine is at present difficult, as the opsonic index is unreliable in many cases. In the series recorded they used the clinical symptoms as the guide. An inoculation of 20 to 50 millions has never had any bad effect in an adult case, and they suggest that a suitable initial dose would be from 20 to 30 millions. After twenty-four to forty-eight hours a second dose may be given, and further doses at suitable intervals if necessary. As the crisis is approached the dose should be decreased. Apparently their practice was to give an immediate dose of a stock vaccine, and use the autogenous vaccine as soon as possible thereafter. After inoculation there was frequently a definite improvement in the clinical symptoms, such as immediate fall of temperature and lessening of the dyspnœa and delirium. The duration of the disease seemed to be shortened in some cases, and in others the fever ended by lysis. The most striking benefit was seen in cases running a protracted course. In some the stock vaccine gave no result, but an autogenous vaccine almost immediately produced striking effect.

Allen[7] also rèports successful results with pneumococcic vaccine in a severe case of pneumococcic septicæmia with arthritis, and abscesses in the muscles, and in a case of a delayed resolution after pneumonia.

Bronchial Asthma is, according to Carmalt-Jones,[8] also within the scope of vaccine treatment. One cause of spasmodic dyspnœa in chronic bronchitis is, he thinks, a specific bacterial toxin, the result of a definite infection amenable to treatment with the corresponding vaccine. In two cases he has isolated a peculiar organism from which he prepared a vaccine which, in these cases, markedly relieved the breathing, but had no effect on the cough. He subsequently tested

this vaccine on 52 cases, with very good results in some cases. Thirty-one cases found some improvement in the frequency, and 39 in the severity, of their attacks ; 26 have improved in their powers of taking exercise, and 29 have slept better. Only 4 cases derived no benefit.

Allen[9] states that he has used vaccines with some success, the majority benefiting, in about twenty cases of **Asthma and Bronchitis.** He has not been able to detect a specific infecting organism. He concludes : (1) That bacteria play a by no means unimportant rôle in bronchitic asthma ; (2) That no one bacterium is responsible—probably most of the catarrhal organisms play a part, but others cannot be excluded ; (3) That considerable good can be done by mixed vaccines in some cases ; and (4) That accurate bacteriological and cytological observations upon a series of cases, correlating these with clinical observations, are much required to place the vaccine therapy of the condition upon a sound footing.

Gonorrhœa.—Eyre and Stewart[10] show that vaccine treatment in gonorrhœa is a powerful remedy, which requires considerable caution in its use. A stock vaccine from a dozen different strains gave almost as good results in acute gonorrhœa as autogenous vaccines. Small doses at frequent intervals are better and safer than large doses at long intervals. After an injection of from 500,000 to 2,000,000, the negative phase is either absent or extremely transient; but 5 to 10 millions may be followed by a negative phase of usually not more than forty-eight hours, followed by a positive phase of three to five days. Small doses of vaccine raise and steady the opsonic index, and a steady index just above normal is the most favourable condition for rapid recovery. In chronic gonorrhœa, with complications, the vaccine treatment is useful. When the gonococcus alone is the infecting organism, routine injections of from 1 to 2 millions every three to five days are satisfactory. If 5 millions are used, the interval should be five to seven days ; after 10 millions, eight to ten days. Larger doses are not usually required. Treatment should always be by small and gradually increasing doses at frequent intervals. Large doses are dangerous. In orchitis, small doses quickly relieve pain. In arthritis the treatment is of considerable value; in iritis the severe pain is relieved in forty-eight hours and disappears in from three to six days.

Hale White and Eyre[11] report four cases of **Gonorrhœal Arthritis** in which vaccine treatment was used with complete success.

Nastin.—This substance seems to be of distinct value in the treatment of **Leprosy.** In these lesions an acid-fast bacillus, resembling in its staining reactions the tubercle bacillus, is easily detected. Considerable difficulty has been experienced in cultivating this bacillus. In 1904 Deycke succeeded in growing a streptothrix which is constantly present in fresh lepromas. On specially sterilized cream it gives a thick, orange-coloured growth consisting of a dense felt-work of acid-fast rodlets and bacillary fragments. If treated in a Soxhlet apparatus, a neutral fat can be extracted which is the substance called nastin. A similar fat is present in Hansen's bacillus. Injected into

leprous patients, nastin only produces a reaction if there is a leucocytosis. Consequently, Deycke associated with the nastin a leucocytosis-producing substance. At first he used cinnamic acid, but latterly found that benzoyl-chloride was preferable; he found that this readily removes the fat from both the streptothrix and the lepra bacillus. Benzoyl chloride injected alone produces no reaction in leprous patients, but injected along with nastin it produces a marked reaction. He thinks that the nastin forms a loose combination with the benzoyl chloride, which is carried to the bacilli and there acts upon them, removing their protective fat envelope and thus rendering them more easily dealt with by the leucocytes. The nastin is itself inert, and apparently only plays the part of a carrier. It is not desirable to produce a reaction with excess of nastin. The essential part of the treatment consists in the solution of the fatty envelope of the bacilli by the benzoyl chloride, which enables the bacilli to be dealt with by the ordinary phagocytic processes of the body. For therapeutic purposes nastin and benzoyl-chloride are combined in varying proportion with olive oil, known as nastin Bo, B1, and B2. the normal combination is Nastin B1, and it causes no reaction unless used too quickly. It is employed at first in doses of 1 cc. weekly, but if well borne, this is gradually increased till in mild cases this dose may be given daily. It is necessary to avoid any trace of water in the syringe, or local abscesses may be produced from formation of hydrochloric acid. Improvement is due to a large extent to physiological processes, and is consequently slow, and in the majority of cases extends over many months.

Some of the Indian authorities speak very highly of the results obtained with nastin treatment. Smith and Bisset[12] give detailed reports of six cases of well-marked leprosy which afford striking proof of the efficacy of the treatment. The anæsthesia disappeared; massive infiltration of the face resolved; old ulcers healed, and the hairs of the head and eyebrows, etc., began to grow again. Similarly, Williams[13] records a series of cases which show that nastin treatment has a specific effect. Kupffer[14] also states that it is in his experience the best remedy for leprosy.

[A private report from the West Coast of Africa was also highly favourable.—F. J. C.]

REFERENCES.—[1]*Lancet*, Sept. 26, 1909; [2]*Ibid.* Oct. 31, 1908; [3]*Clin. Jour.* July 10, 1909; [4]*Lancet*, July 17, 1909; [5]*Brit. Med. Jour.* June 26, 1909; [6]*Ibid.* Oct. 9, 1909; [7]*Lancet*, Sept. 11, 1909; [8]*Brit. Med. Jour.* Oct. 9, 1909; [9]*Lancet*, Sept. 11, 1909; [10]*Ibid.* July 10, 1909; [11]*Ibid.* June 5, 1909; [12]*Antiseptic*, Feb. 1909; [13]*Bombay Gaz.* Feb. 25, 1909; [14]*Centr. f. d. gesam. Ther.* June, 1909.

VERONAL.

Reich and Herzfeld[1] find veronal useful in the treatment of **Vomiting during Pregnancy,** particularly in those cases which seem to depend upon a purely reflex cause without any special reason for the vomiting. They also recommend it in those labour cases where there is a protracted

first stage, and consequently a sleeping draught is indicated to enable the patient to conserve her strength. They find that veronal allays the pain of the uterine contractions, but does not seem to diminish their intensity, and the labour proceeds with the patient in a dazed, dreamy condition. For such an action a dose of 4 to 7 gr. is sufficient. Should it be necessary subsequently to administer an anæsthetic, it will be found that very little is required to put the patient thoroughly under.

The toxic effect of veronal seems to vary considerably in different individuals. A case was reported in 1906 by Umber in which 20 grams of veronal did not prove fatal, though severe cerebral symptoms were produced which passed off in five days. A recent but less severe case of over-dosage is recorded by Clark,[2] where a man, aged 35, took 100 gr. of veronal within the space of an hour. He slept practically continuously for two and a half days, but made an excellent recovery. During the first day he could not be roused, the pupils were dilated, respiration was shallow, but there was no cyanosis and the pulse remained about 72. The kidneys did not act till the second day, when he passed urine, non-albuminous, in small quantities. The pupils were still dilated, and no response was obtained to slapping and punching, though he seemed to respond to shouting in the ear. After he came to himself, he complained of being tired, and of vertigo, and fell on the floor when he got up.

The most usual toxic symptoms produced by veronal are skin rashes, itching, and headache. It is stated that occasionally a spastic condition is seen, and Ollerenshaw[3] gives details of a case in which the continuous use of veronal seems to have produced a spastic condition. The patient was a medical man, aged 47, who developed mastoid inflammation which was treated surgically, but not very successfully, as chronic trouble ensued. Subsequently the patient, who all along had been taking veronal without the knowledge of his medical men, developed giddiness and headache, with some optic neuritis. At this stage he had several strange attacks, in which he became semi-conscious and very spastic. It was thought that he might have a cerebellar abscess, but nothing could be detected on operation, though it was stated that the intracranial pressure was increased. Subsequently it was found that the patient had been persistently drugging himself with veronal, and apparently as a result of this, he died. A post-mortem examination was performed, but no tumour or abscess was found.

The newer synthetic hypnotics are usually but slightly soluble in water. This sometimes causes unpleasant effects owing to delayed absorption. A soluble form of veronal has been discovered, obtained by carefully neutralizing veronal (diethylbarbituric acid) with sodium carbonate. By the substitution of sodium for one of the replaceable hydrogen atoms contained in veronal a monosodium salt is obtained. Sodium diethylbarbiturate is a white crystalline powder, readily soluble in five parts of cold water. The solution is slightly alkaline

and has a bitter taste. It is, however, not very stable, and the addition of even a small quantity of hydrochloric acid decomposes the salt, liberating the insoluble veronal. This interaction with an acid takes place much more slowly if the salt is dissolved in a large quantity of water. The salt is relatively equal to the acid, as 9 parts of the acid (veronal) correspond to 10 parts of the sodium salt.

The monosodium salt of diethylbarbituric acid has been put upon the market under two names. Thus Merck and Bayer call it *sodium veronal*, while Schering's preparation is called *medinal*. The action of the new drug seems similar to that of veronal when administered by the mouth or rectum. This is probably due to the fact that veronal itself is absorbed from the intestine as a sodium salt. If the unstable monosodium salt is administered when the stomach contents are acid, it is probably immediately changed into veronal, which in the alkaline intestinal juices is converted into a sodium salt and absorbed as such.

Steinitz[4] found medinal to act best when the stomach is not over acid and the drug is given largely diluted with water. He advises his patients to take the drug dissolved in a quarter of a tumbler of water three or four hours after a light supper. In this way it reaches the intestine unchanged, and produces a rapid hypnotic action. It acts very well in febrile cases, when little food is taken and consequently the stomach is fairly free from acid contents. He states that even more rapid and more intense effect is produced by administering the drug in the form of an enema dissolved in about 90 min. of water.

Winternitz[5] thinks the action of veronal and of sodium veronal is practically identical, but the sodium salt is better for rectal injections, as it is thirty times more soluble. For oral administration there is little to choose between the two forms, especially if the stomach contains acid. But if the stomach is free from acid the sodium salt gives perhaps a quicker hypnotic action. He agrees with Steinitz that often after rectal administration a more intense effect is obtained than with the same dose given by the mouth, but states that the rectal method is uncertain in action. In a later paper Winternitz[6] points out a curious difference in action between the drug, administered either by the mouth or rectum, and the same dose injected hypodermically either into the subcutaneous tissue or the muscles. Contrary to what one would expect, the injection proves much weaker than the swallowed drug. Roughly speaking, one gram injected is equivalent in hypnotic action to half a gram given by the mouth. He suggests that this is due to the lipoid substances present in the subcutaneous fat and muscle retaining the sodium salt, and thereby preventing it from reaching the central nervous system. He notes that the injection of sodium veronal, though it does not readily induce sleep, has a marked effect in allaying local pain in nerves, e.g., in **Sciatica** or **Intercostal Neuralgia.** He has successfully treated several cases of sciatica by intramuscular injection of sodium veronal between the ischial tuberosity and the great trochanter. (Steinitz had also

observed that subcutaneous injections sometimes markedly relieved obstinate nervous pain.) It seems likely, therefore, that the new form of veronal will not be much used hypodermically for hypnotic purposes, especially as it cannot be given painlessly in less than a 10 per cent solution.

REFERENCES.—[1]*Ther. Monats.* 1908, Hft. 7, in *Centr. f. inn. Med.* Dec. 26, 1908; [2]*Jour. Amer. Med. Assoc.* Nov. 10, 1908; [3]*Med. Chron.* Oct. 1908; [4]*Ther. d. Gegenw.* July, 1908, in *Prescriber*, Oct. 1908; [5]*Med. Klin.* Aug. 2, 1908; [6]*Münch. med. Woch*, Dec. 15, 1908.

YSYN.

This new albumin preparation is a white, fairly tasteless powder, resembling in appearance plasmon and sanatogen. It can be given in cocoa, and does not spoil the taste of thick soups if not used in too large quantities. According to Hoppe[1] it is well utilized, but does not seem to possess any particular advantage over other albumin preparations except that it is comparatively cheap. Thus 100 grams sanatogen cost 3·2 marks, while 100 grams ysyn cost 1·2 marks, but on the other hand plasmon and tropon are much cheaper, costing only 0·60 mark for 100 grams. Compared with other foodstuffs, we find that for the cost of 87 grams albumin in the form of ysyn we can get 144 grams albumin in the form of bread, 160 grams in eggs, and 170 grams in beef.

REFERENCE.—[1]*Ther. d. Gegenw.* Dec. 1908.

AN INTRODUCTION TO THE TREATMENT BY BACTERIAL VACCINES.

BY

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Part I.—Introductory.

Definition of Bacterial Vaccine.—Vaccine therapy must not be confused with serum therapy. The terms are used so loosely that it seems necessary to emphasize this statement. Sir A. E. Wright defines a vaccine very widely: "A vaccine is any chemical substance which when introduced into the organism causes there an elaboration of protective substances." It follows that a bacterial vaccine is a chemical substance derived from bacteria. It is unnecessary to enquire into the chemical composition of these bacterial substances, but it is important to have a brief understanding as to their biological action. The phenomena concerned are embraced under the term "immunity."

Definition of Immunity.—The process of immunization may be defined as the resultant of efforts made by the body to protect itself against bacterial infection by the elaboration of protective materials. It is obvious that any living healthy body possesses, *imprimis*, a natural or normal level of immunity, without which it would fall a prey to countless infecting micro-organisms, and would soon cease to exist. In life, however, a decline below the normal is frequently inevitable; infection of one kind or another occurs; and it therefore becomes necessary briefly to study the factors which are concerned in a restoration of the defences, together with the destruction of the invading forces.

Metchnikoff, from observations on the living animal, postulated that bacterial invasion was met by an army of phagocytic defenders, and gave the wandering leucocyte the credit of defence. Leishman showed, however, that if, *in vitro*, the phagocyte was freed from the blood fluids by citration and washing, its power of absorbing micro-organisms was lost, but returned on the addition of blood serum. This fundamental observation swung back the pendulum from the conception of cellular pathology to that of the humoral; and the discovery that the serum of a typhoid patient clumps an emulsion of the typhoid bacillus was an indication that the fluids of the body rather than the cells were concerned in the processes of immunization. Further investigation of the changes in the blood serum, after inoculation with a bacterial vaccine, or during the period of a specific infection,

has revealed the presence of a definite series of protective substances known technically by various names, such as antibodies, immune bodies, etc. These are named according to their physiological properties and are :—

Agglutinins, which clump the particular bacteria, as in typhoid and Malta fever.

Precipitins, which precipitate micro-organisms in emulsions.

Antitoxins, which neutralize the toxins poured into the system as a result of a localized bacterial infection, as in diphtheria and tetanus.

Lysins, which promote a solution and destruction of bacteria, and in certain conditions the red corpuscles (cytolysins).

Opsonins,* which appear to occur in every bacterial infection. These combining with the bacteria make them attractive to the white corpuscle.

The properties of these last antibodies have been investigated by Wright, following Leishman's method. These link themselves with the living bacteria in the body, and render them edible by the white corpuscles, and are therefore, as mentioned above, the chief factor in phagocytosis.

It appears that these antibodies are produced by the stimulating action of the endoplasm of the bacteria on the tissue fluids. The side-chain theory of Ehrlich and the researches of Bordet† are taken to afford a working hypothesis as to the production of these bodies, which it is not necessary here to recapitulate. Wright and Douglas, from 1902 onwards, perfected a method by which it became possible to estimate the relative amount of opsonins in a particular infected body, to the healthy normal one, and from observations in connection with inoculations of bacterial vaccines succeeded in arriving at certain fundamental principles concerning the processes of immunization, without a knowledge of which therapeutic inoculation is an unjustifiable gamble.

The Opsonic Curve.—They showed both in the case of the staphylococcus and tubercle bacillus (and it has since been verified for most other bacteria) that inoculation of a bacterial vaccine produced an initial and temporary fall of the opsonic content ; this was followed by a slow and gradual rise to a point higher than the starting line, to be succeeded by a gradual drop to the original level. The introduction of a second inoculation early in the return ebb produced a repetition of the above curve, with the result that a still higher point was reached at the "high tide of immunity." On the contrary, however, if a maximal dose was given, the initial drop or negative phase was profound and prolonged ; the succeeding rise or positive phase did not often attain even the initial level, and the result was a loss rather

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* From *οψωνέξω*, I prepare a meal for.

† *Immune Sera*, Wassermann, translation by Bolduan, published by Chapman Hall.

than a gain. Further, the employment of doses at too frequent intervals failed to take full advantage of the rising tide, and tended sooner or later to produce an adverse series of negative phases.

Clinically the period of positive phase indicates a time during which an active destruction of living bacteria is taking place, and is evidenced by improvement in the general condition, and, if fever is present, a lowering of the temperature. Conversely, during a negative phase the invading bacteria have an increased opportunity of multiplying, and the progress of the disease may be accelerated to an alarming and often fatal issue. The possibility of auto-inoculations has therefore to be reckoned with in considering the problem of vaccine therapy. The difficulties and complications would appear to be insuperable, but fortunately improved methods of observation have done much to simplify the work of the clinician. The question of auto-inoculations will be further considered in the section on tubercle.

Bacterial invasions may be divided into two classes: (1) Those which are purely local; and (2) Those which invade the whole system through the lymphatics or the blood-stream. From the foregoing considerations it is at once clear that local infections can be dealt with under the principles of vaccine therapy. It is conceivable that the infected area can be kept at rest so that none or only a minimal amount of toxins, or bacteria, dead or alive, shall be transmitted to the rest of the body. A study of the opsonic index in such cases indicates whether, under favourable conditions of rest, the general resistance improves, owing to properly regulated auto-inoculation, or the stimulus of artificial inoculation is required.

The general invasion through the blood-stream is otherwise; and indeed at the outset it would seem that no good could accrue by bacterial inoculation. It appears, however, that a different train of phenomena is set in motion when the invasion is by the blood-stream and is not confined locally to the tissues. If a bacterial vaccine is thrown into the blood-stream, the amount of protective materials evolved is very small as compared with the introduction of the same pabulum into the tissues. In other words, the production of protective materials is fundamentally a tissue and not a blood reaction; and in this is to be found a possible explanation as to why therapeutic inoculation into the tissues has been found to give such almost incredible results in acute pneumonia, endocarditis, and even erysipelas, diseases which are essentially systemic. The further consideration of this class (2) will be considered in detail when referring to these infections.

This is a brief outline of the principles involved in therapeutic inoculation; the student will find the subject fully discussed in the collection of papers recently published by Sir A. E. Wright.[1]

"A man is as old as his arteries." It is possible to go a step further and to postulate that age is the outcome of the incessant warfare of the tissues against microbial infection, whether normally from the

respiratory and digestive tracts, or from some accidental source. For instance, the invasions of the coli bacillus, if only of a mild nature, in time undermine the digestion, damage the mechanism of secretion and excretion, and poison the whole system with toxins. Again, the group of micro-organisms which infect the respiratory tract give rise to bronchitis, bronchial asthma, and the subsequent changes in the lungs and circulatory system. A bronchitic at forty looks and is as old as a normal man of fifty.

The acute infections we recognize and treat as something outside and foreign to the body; the chronic, we have hitherto labelled and pigeon-holed as constitutional. We have shaken our heads and said "Kismet; it is his constitution; he is a poor life; look at his family history;" and we conceive that we have done our duty. Not many years ago this was said of tuberculous infections, particularly phthisis; now we realize that this infection is not only avoidable but curable, when we view the subject from the standpoint of the immunizator. And the time is not far distant when the hitherto ill-recognized chronic infections of the linings of our bodies will receive their proper recognition and treatment by bacterial inoculation.

Part II.—Pathogenic Infections.

Infections by the Tubercle Bacillus.—The tubercle bacillus produces a local lesion whence toxins, antibodies, and living T.B. themselves, may be disseminated into the body. The living T.B. may colonize and thus establish fresh foci. Any organ and any tissue may become infected. Owing to the nature of the lesion produced, it is usually easier for soluble toxins and antibodies to be disseminated than the microbes themselves in the earlier stages before the tubercle breaks down. It follows then that therapeutic treatment in the raising of the bodily resistance by the dissemination of the proper amount of antigens—substances which go to the production of antibodies—depends chiefly upon the situation of the lesions. In the lung it is almost impossible to avoid auto-inoculations; in many other organs this process can be arrested by absolute rest. Over-flooding of the tissues with antibodies is identical with over-inoculation, and, by producing negative phases, lowers the general resistance and favours bacterial colonization. This is evidenced clinically by rises of temperature and a spread of the disease. A period of absolute rest, followed by carefully adjusted exercises, enables the proper adjustment of antibodies to be re-established, and the continued production of these substances to maintain the tissue resistance.

If observations of the opsonic index show that only a low level of immunity can be maintained by harnessing, as it were, the products of the disease itself, artificial inoculations with a tubercle vaccine, combined with rest, should be employed. Conversely, this should not be used when the index is fluctuating widely,

A full appreciation of these considerations at once emphasizes the

necessity of attacking this infection in its earliest stages ; and further, success in treatment depends largely upon the situation of the lesion. Lastly, the personal equation—the capability of the individual to respond to antibacterial stimulation, whether natural or artificial—must enter into the physician's calculations. This last factor perhaps was considered the most important until recently, when the necessity of minutiæ in the treatment by rest and exercise was established by Paterson, at Frimley, in the case of lung-infection. He has conclusively proved clinically, and Inman has verified his results by opsonic observation, that in early lung-infection, auto-inoculation, regulated by rest and exercise, is a more powerful factor in treatment than inoculations with tuberculin. Indeed, in the hands of most immunizators, the tuberculin treatment has lamentably failed in the arrest of phthisis if the rest factor has been neglected.

With tuberculous infections of bones and joints the conditions are somewhat different. Absolute surgical rest is necessary, with or without surgical interference. The circulation is not so intense as in the lung, and under resting conditions auto-inoculation ceases. The published results of Wright and his pupils,[2] and of other independent observers, have already established beyond doubt the efficacy of tuberculin inoculations in these infections. Much, however, can be done, as was shown many years ago by Bier, if in the resting stage his methods of passive congestion can be employed. It is usually, however, necessary at some time or other to combine this treatment with that of artificial inoculation. It is obvious that in this type of infection the treatment, to be fully successful, must be combined with inoculation.

A third class of tuberculous infections which require inoculation treatment are infections of glands, particularly in children. The weakly child of low stamina is probably in this condition, if he be infected with tubercle, from the virus of the disease, and not from vague constitutional deficiencies.[3] Periods of inoculation of several months' duration, extending over several years, have amply repaid the time and trouble expended. It is impossible in this article to do more than indicate the lines of treatment, but it must always be remembered that a child who has glands in the neck and in the groin has probably many more hidden away in the mediastinum and mesentery.[4]

Vaccine therapy in tuberculous meningitis has not proved successful ; in the few cases which have been published, little or no response to inoculation has been recorded.

As regards dosage, in children $\frac{1}{10000}$ to $\frac{1}{5000}$ mgram of T.R. is ample, and should be given about every eight to ten days. Frequently $\frac{1}{20000}$ mgram T.R. is sufficient. For adults the amount ranges from $\frac{1}{10000}$ mgram to $\frac{1}{5000}$ mgram. An overdose is evidenced opsonically by a negative phase, and clinically by malaise, headache, and often a rise of temperature.

Koch's tuberculin T.R., or the new tuberculin emulsion T.E., may

be obtained in the required doses from Allen & Hanburys. Each dose is put up in glass bulbs. Of the other preparations from the tubercle bacillus, Béraneck's appears to be of considerable value, and may be employed in lieu of T.E. and T.R. Denys' tuberculin contains an undue proportion of toxins, which tend to raise the temperature, without a corresponding excitation of antigens.

Béraneck's Tuberculin.—Tubercle bacilli are grown in a mixture of veal broth and solution of lime at 37° to 38° C. This is filtered, and the filtrate evaporated to a syrupy consistence. The filtrate is claimed by Béraneck to contain a group which he calls "basitoxins." The T.B. which have not passed through the filter are digested with a 1 per cent solution of orthophosphoric acid, and filtered. This filtrate contains a group which Béraneck calls acidotoxins. A mixture of the two filtrates in equal parts constitutes his tuberculin.

Denys' Tuberculin.—T.B. are grown in glycerin broth, which is afterwards filtered. The filtrate constitutes Denys' tuberculin.

As regards the seat of inoculation, it is advantageous to introduce the vaccine in such a situation that the lymph-stream may carry the antibodies produced towards the seat of the lesion. Béraneck recommends that his preparation be injected, in the case of glands, actually into the infected tissues.

Infections by the Staphylococcus Aureus, Citreus, and Albus (liquefying Gelatin).—These are widespread, but local. They may range from the suppurating acne pustule to the boil and abscess. The ordinary staphylococcus is essentially a pus-producing micro-organism. The pus should first be evacuated. The staphylococcic vaccine is not particularly toxic, its therapeutic action is extremely rapid, and it should be employed in doses of 250 millions of the dead microbes. The original doses were very much higher, varying from 2500 millions to 5000 millions.

The staphylococcus is responsible for many secondary infections where tissue destruction occurs, and is invariably the cause of sloughing in superficial lesions, such as burns, etc. This vaccine should be used as a routine practice in these cases, and repeated weekly. It is not necessary, usually, to employ an autogenous vaccine, but care should be taken, as with all vaccines, that it is made from cultures which have been derived as early as possible from the infected tissue. Subculturing lowers the virulence of any organism, and lessens its potentiality as a vaccine.

Staphylococcic abscesses of bone should always be treated surgically, and if obstinate a determination of body fluids rich in opsonins and other antibodies to the lesion may be effected by the employment of Bier's suction apparatus. Chronic sinuses with thickened walls must often of necessity be scraped and similarly treated, because of the poor blood-supply to their thickened walls.

These observations apply with equal force to similar lesions occasioned by other microbes, such as the pneumococcus, coli bacillus, and gonococcus.

Acne.—Recent investigations by Fleming[5] have shown that the primary lesion in acne is due, not as was originally postulated by Wright and Douglas, to the staphylococcus, but to a bacillus identical with that described by Sabouraud. If the contents of an acne pustule be spread in a thin film on a slide and stained with carbol thionin, it is shown clearly as a short, slightly bent bacillus. It may be grown on acid nutrient agar to which a trace of oleic acid (0·2 per cent) has been added. The staphylococcus if present will not grow on this medium. The failure of the ordinary staphylococcic vaccine in the treatment of acne is thus explained. If the staphylococcus is present, as frequently occurs, a vaccine made from this organism should also be employed. The dose of the acne bacillus vaccine is from 150 millions to 300 millions of the dead organism.

The Eczemata.—The eczemata may be classified for laboratory purposes into dry and moist. The condition is probably one partly of degree, and partly due to the percentage amount of lime salts in the blood (variation of viscosity). From the dry variety cultures should be obtained, after careful washing of the skin, by raising a scale, and with a platinum wire obtaining cultures from the under surface. In the case of the weeping variety, after similar treatment, cultures may be obtained from the fluid. It is not difficult to get cultures of a somewhat shy, slow-growing, staphylococcus, which, unlike the ordinary variety, does not liquefy gelatin. A vaccine, the dose of which is 150 millions to 300 millions, given once a week, has been shown to be an absolute specific. The severe dermatitis, with the intolerable itching, soon subsides, and a cure is effected in three to four weeks, even after the disease has been in progress for a considerable period. Occasionally the streptococcus is a factor in the weeping variety, and occurs in the deeper layers.

Infections which are Localized, but which may become Systemic.

Streptococcal Infections.—Of these erysipelas is clinically the commonest. Usually auto-inoculation occurs, producing a spontaneous cure. It is, however, worth while to employ a streptococcic vaccine if it appears that a general infection is in evidence. By inoculation as in pneumonia, the crisis may be precipitated, and an overwhelming toxæmia averted.[6]

Acute septicæmia, puerperal or otherwise, if of streptococcal origin, should always be treated by vaccine therapy. The occasional success of the antistreptococcic serum depends upon its accidental value as a vaccine.[7]

The distressing recurrences of erysipelas of the face which occur in many individuals are shown by opsonic investigations to correspond with a variation in the content of the immunizing substances. Locally the tissue resistance and the circulation are impaired by repeated attacks. It needs only fatigue, or even a blast of cold air, to depress

the local resistance sufficiently for the microbe again to become active. Such cases can be absolutely cured by weekly inoculations of 5 millions of a stock streptococcic vaccine, if necessary combined with local massage or Bier's cupping. In cases of endocarditis of streptococcal origin, Douglas[8] has shown that the infection can be completely arrested; and in a recurrent case of a child the writer[9] obtained a similar result. In both these cases an autogenous vaccine was used. This subject has been fully discussed by Horder.[10]

Pneumococcal Infections.—In dealing with infections caused by Fränkel's pneumococcus, the evidence at present available is in favour of using an autogenous vaccine. The pneumococcus is capable of great variation in its virulence, so that it may be that stock vaccines have failed because they have not been prepared from sufficiently virulent strains. It is, however, worth noting that more consistent results have been obtained with a vaccine prepared from the material of a virulent and rapidly fatal pneumonia than with one from the exudate of a mild case. At present, if time allows, it is better to prepare an autogenous vaccine. The pneumococcus, if grown on nutrient agar which has been flooded with a thin film of fresh human blood from a sterilized finger prick, will grow rapidly. The pneumococcus can be obtained pure by puncturing aseptically the consolidated lung with a hypodermic needle, drawing off a few cubic centimetres of blood, and flooding agar tubes with it. Frequently the microbe can be grown pure from the sputum, or from venous blood, in pneumonia. The possibility of producing an artificial crisis in pneumonia by inoculation has been called in question; but the experimental evidence of Macdonald,[11] and the clinical results obtained by the writer,[12] confirmed by Willcox and Parry Morgan in a paper read at the Belfast British Medical Association meeting in July, 1909, support the statement that such can and actually does happen.

It is difficult to explain how the protective mechanism is thus suddenly and efficiently called into play merely by the introduction of so infinitesimal a number of dead microbes, as compared with the total content existing in the infected host. It must be remembered, however, as has been stated above, that the reaction of dead microbes in a healthy area of tissue, such as is obtained by bacterial inoculation, produces infinitely more protective substances than if these microbes are introduced into the circulation. It must further be remembered that in pneumonia the infecting organisms are found in the damaged lung and in the circulation.

It is obviously necessary in pneumonia that the treatment be adopted early, as the selective affinity of the toxins for the circulatory mechanism in this disease is usually the proximal cause of death. It follows that it is necessary, if possible, to cut short the disease before sufficient toxins are poured into the circulation for this to happen. Further reference need not be made to this question, as it has been discussed more fully in a recent paper.[13]

As in streptococcal infections, vaccine therapy is by no means

confined to treating acute cases in their early stages. Pneumonias which have failed to crisis, and exhibit a fluctuating temperature, showing that an incomplete attempt has been made towards self-immunization, may frequently be arrested by inoculation. Complications, that is, infections of other areas, such as joints,[14] the heart, etc., after the acute pneumonic stage has been passed, can be cured by a systematic course of inoculation.

As regards dosage, 25 to 50 millions of the dead pneumococcus may be given as often as every forty-eight hours during the attacks of pneumonia. Though the estimation of the opsonic index is desirable, it is not necessary to employ it as a guide to inoculation in acute pneumonia. Macdonald has shown that the index is low during the days preceding the crisis; and that there is a rapid rise at the crisis, which is maintained if it is successful, and that the return to the normal line occupies several days. In a disease which runs so definite a periodic course as pneumonia, it would seem unnecessary to waste time estimating indices, when the preparation of a vaccine is the more pressing need.

Infections by the Bacillus Coli.—The *Bacillus coli* comprises a group of allied micro-organisms which differ from each other chiefly in the chemical changes they produce upon special media. It appears that one variety does not protect against another, so that it is particularly necessary to prepare an autogenous vaccine in each case, and to select material which shall contain the particular variety which has become pathogenic.

The infections are numerous, and indeed the coli bacillus is prone to infect most areas of the trunk below the diaphragm. The varieties of the coli organism normally inhabit the colon, and are prevented from colonizing into the walls of the large intestine by the protective materials normally present in the blood. When these are deficient, or a lesion of the bowel-wall occurs from other causes, they may invade the walls, causing various degrees of colitis. In injuries of organs in proximity to the bowel they may produce secondary infections, such as coli infection of the kidney or bladder. They are found in pelvic abscess, in the uterus in inflammations of that organ, and in the ovaries. In the gall-bladder they cause thickening of the bile and the formation of bile-stones by the deposition of cholesterin.

In many of these infections it may be that the coli bacillus is the primary agent. Many cases of appendicitis are due to the coli bacillus. This organism occurs also in the stomach, and the recurrent bilious attacks in children, frequently associated with mucus in the fæces (colitis), are probably due to the same cause. Repeated invasions of the coli bacillus may lead to the formation of secondary metastases in bones and joints, and in rare cases a general coli infection has been recognized.

There may be more than one variety responsible for the pathogenic condition, and this may be suspected if a partial amelioration

only is secured with the first vaccine prepared. It is therefore necessary from time to time to obtain fresh cultures, and if the services of a skilled bacteriologist are available, to compare the results. If this is impossible, the inoculation of a new vaccine made from the more recent cultures will usually improve the condition. It is obvious then, that without an amount of detail work which it is impossible in most cases to afford, there is considerable risk of obtaining cultures from the fæcal material which do not contain the offending micro-organisms. It is possible, however, to eliminate error very largely. For instance, in colitis, from time to time, quantities of mucus are passed per rectum. If a portion of this mucus be carefully washed in sterilized normal saline several times, cultures may be obtained from the mucus which probably are those of the specific organism.

In the infection of organs other than the bowel, usually the pathogenic variety or varieties alone are present.

The coli bacillus grows very readily and quickly on nutrient agar, and it is advisable to make the vaccine from cultures not more than ten or twelve hours old. This vaccine was occasionally found to give rise to rigors and fever. The writer has found that this undesirable toxicity may be practically eliminated if, firstly, only young cultures are used, and if, secondly, the microbes be washed in saline and then precipitated by centrifuging before finally emulsifying and sterilizing at 60° C.

The usual dose is from 5 to 10 millions of the dead organism for adults; 2 to 5 millions for children. This may be given every five to ten days, and, as the cure proceeds, at longer intervals.

Toxic symptoms, after inoculation with a coli vaccine, are usually headache and fever, sometimes preceded by a rigor. The temperature may rise in a few hours as high as 104°, but the attack quickly passes off, and unlike the negative phase in tubercle, there is usually great improvement after such an attack. As such attacks are obviously undesirable from everyone's point of view, it is advisable to use the precautions mentioned above for eliminating these toxins.

Infections by the Pneumobacillus of Friedländer.—This organism is frequently responsible for the conditions of diffuse catarrhal pneumonia, and the bronchopneumonia in children. An examination of the sputum will reveal its identity. Many infections of the urinary tract are due to this micro-organism, which has in this situation been mistaken for the coli bacillus until cultures have been obtained. It may also occur in sinuses and chronic abscesses. The vaccine is made in the ordinary way, and the dosage is from 50 to 100 millions.

Infections by the Gonococcus.—These are too well known to need recapitulation. Occasionally, in the infection of a joint, long after all primary local manifestations have disappeared, it becomes necessary to determine whether the infection is tuberculous or gonococcal. Estimations of the opsonic index during rest, and an hour after the application of Bier's passive congestion method, or after simple massage, will show to which organism a variation of the index

occurs.[15] The organism which shows a variation is the infecting one. A standard vaccine may be used.

Infections of the Upper Respiratory Tract other than those of the Pneumococcus, Streptococcus, Tubercle Bacillus, and Diphtheria Microbe. —The vaccine therapy of the pathogenic organisms in this group is under consideration at the present time. Work has been done by Wright, Carmalt-Jones, Benham, Allen, the writer, and others. It is perhaps inadvisable at the present moment in an article of this nature to do more than indicate the principles and conditions under which such work is undertaken.

It may be taken as established that every acute or recurrent catarrh, wherever it may be situated, whether in the nasopharynx or the bronchial tubes, is occasioned by one or a group of pathogenic microbes. The mere fact of recurrence in an individual, apart from a single accidental infection in the course of an epidemic, is, if the identity of the organism be established, a proof of a tendency in that individual to a loss of immunizing power against that particular microbe. Further, both Benham[16] and Allen have shown that in acute cold there is an actual lowering of the opsonic index to these germs, and that during the stages of recovery the index rises. The rational treatment then, for individuals afflicted with bronchitis, bronchial asthma and the like, is the avoidance of such conditions as produce either a general or a local lowering of their resistance ; and further, if this does occur, to effect at once by vaccine therapy the raising of their immunizing power.

In many cases the recurrence of infection seems almost to be periodic, and largely determined by atmospheric and climatic conditions. Evidence is gradually forthcoming that prophylactic inoculation will prove more satisfactory, and less costly in time and money, than seeking summer climes and subtropical health resorts.

The organisms which are included in this group are : The influenza bacillus of Pfeiffer, the *Micrococcus catarrhalis*, the *M. tetragonus*, the group of pseudo-diphtheroids, including the *Bacillus septus* of Benham, the bacillus of whooping-cough (Bordet), and the micro-organism of bronchial asthma (Carmalt-Jones). The reader is referred to the various papers[17] on these organisms for further details.

Part III.—The Laboratory and the Technique.

For the general practitioner who desires to pursue his own investigations an elementary knowledge of bacteriology is necessary ; further, a course of study at a laboratory devoted to this particular work is highly advisable. For the man who cannot afford the time for this, it is sufficient to be able to make films of blood, urine, or pus, and to know how to collect materials for forwarding to the laboratory for investigation.*

* Full details and materials may be obtained from the Clinical Research Association, or from any laboratory undertaking this work.

Films.—A glass microscope slide is cleaned by rubbing with watchmaker's No. ooo emery paper; the corners of a second slide are broken off after nicking with a file. A drop of the material is put on the first slide (*Fig.* 1), and the second slide is used as a spreader. An even thin film is thus easily obtained.

Swabs.—Into a test tube a piece of wire bent at the end holding a swab of cotton wool is passed (*Fig.* 3), and the open end plugged by wrapping absorbent wool round the wire. The whole may be sterilized by gently heating over a spirit flame or by placing in the oven until the wool swab begins to turn brown. Larger specimens may be placed aseptically in stoppered bottles which have been previously sterilized by boiling.

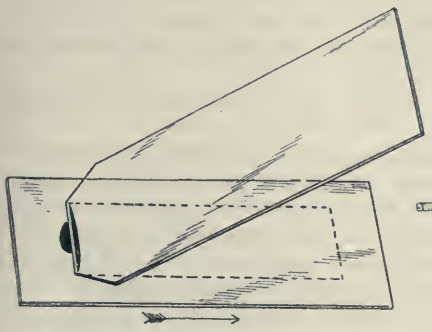

Fig. 1.—Slide and spreader for preparation of film.

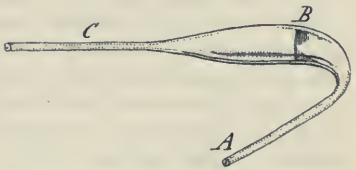

Fig. 2.—Pipette for opsonic estimation.

Fig. 3.—Sterilized swab for laboratory work.

To obtain samples of blood for estimation of the opsonic index, it is advisable to use Wright's blood tubes.* They are easily made by taking a piece of $\frac{3}{16}$ in. soft glass tubing, drawing out in a blow-pipe, and bending over (*Fig.* 2); a number can be made successively until the length is used up. To draw up blood, a tape is passed round the finger at the terminal joint, a prick is made $\frac{1}{4}$ in. behind the nail, and the terminal phalanx flexed; both ends of the blood tube are broken, and the bent end (*a*) placed in the blood, which runs up until the tube is filled to *b*. Loosening the ligature and swinging the arm round will always give sufficient material if more is required. The

* Obtained from R. B. Turner, 11, Foster Lane, E.C., or from Allen & Hanburys, Parke Davis & Co., The Lister Institute, and all laboratories.

tube is then held in the spirit or Bunsen flame at *c* close to its shoulder; air is driven out through the straight end, and when the glass is sufficiently soft it may be drawn out and the end so sealed. As it cools a partial vacuum occurs, and the blood in the bend will run round into the body of the tube. The blood may now be shaken down to *c*. It only remains to seal the tip (*a*) in the flame. If kept in the dark and *not heated at all* in the process of collection, such a sample will yield a reliable opsonic index after three or four days.*

The practitioner who is desirous of pursuing his own investigations (at any rate the preliminary ones) requires but a simple outfit. The laboratory work naturally falls into the following groups:—

(1). *Preliminary investigation as to the infecting organism by means of stained films of blood, sputum, urine, pus, and mucous discharges.*

(2). *Preparation of culture media and obtaining of pure cultures of invading bacteria.*

(3). *Determination of opsonic index, or agglutination, after obtaining a pure culture.*

(4). *The preparation of an autogenous vaccine from the pure culture.*

The first group certainly comes within the province of the general practitioner who is wishful for accurate results. The apparatus required is a good simple microscope with an oil immersion ($\frac{1}{12}$ in.) and a sub-stage condenser—an English-made instrument will cost from £12 to £15; a gross of ground slides, and such staining reagents as carbol fuchsin, carbol thionin, gentian violet, and the solutions for Gram staining.† If there is a sink available with running water, a metal bridge for holding the slides saves much time.‡ A few glass troughs§ are also necessary. All films are ultimately dried with blotting paper. On the average it takes ten minutes to prepare a film and examine it. Surely the information gained is worth so small an expenditure of time and labour.

The methods of staining and recognition of pathogenic organisms can be obtained by reference to bacteriological manuals, and verification by sending samples to a laboratory.

It is thus apparent that the practitioner can do much for himself.[18] He will find that in this particular part of the work self-education is easy, that his investigations will give added interest to the daily round, and that his early efforts will supplant some outside and wholly unremunerative hobby.

The work in the laboratory under groups 2, 3, and 4 is of a more specialized character, and needs a detailed training. It is therefore obviously beyond the scope of this article to do more than indicate the requirements. The actual technique of preparing culture media

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* Full details and materials may be obtained from the Clinical Research Association, or from any laboratory undertaking this work.

† *Vide* any manual of bacteriology. ‡ Hoyer, Praed Street.

§ Obtained from R. B. Turner, who supplies all glass laboratory ware.

is given in the larger text-books.* The apparatus needed is either a jam or fruit sterilizer or, better, a small autoclave, test-tubes, flasks, cotton wool, filters, and a gas supply; lastly, a Hearson's bacterial incubator, small size.

The apparatus for the determination of the opsonic index include a supply of quill glass tubing, a blow-pipe (gas), an opsonic incubator, which is handier than the ordinary Hearson, a water-driven centrifuge, and the articles necessary in group 1.†

The apparatus for preparing vaccines has already been obtained for the previous groups. A thermo-regulator‡ to work at 60° C. should be added, and can be used in an aluminium saucepan. Various methods of preparing and standardizing vaccines have been employed. The following is simple and sufficiently accurate.

A pure and recent culture of the infecting organism is obtained on nutrient agar, or a necessary modification of it; this is scraped out into about 10 cc. of 1 per cent saline (sterilized) in a test tube. The suspension is heated for an hour at 60° C., which completely kills the microbe without destroying its therapeutic efficiency. The open end of the test tube is then sealed in the blow-pipe and allowed to cool slowly. The contents of the tube can then be thoroughly shaken, either by hand or in an electric shaker, to obtain an even emulsion free from clumps. If the bacteria are sticky and clumps are inevitable, it may be necessary to allow these to settle, and to draw off the supernatant emulsion. A pipette, made by drawing out a piece of ¼-in. quill tubing is taken, and marked about 1 in. from the fine end with a blue glass pencil.† Three watch-glasses are arranged, the first holding 2 per cent saline, the second some of the emulsion to be standardized, while the third is used for mixing purposes. A teat is placed on the large end of the pipette. The finger is pricked and a drop of blood exuded. About five measured volumes (on the pipette) of saline are taken up, then an air bubble, then one measured volume of emulsion, an air bubble, and lastly one measured volume of blood. The whole are ejected into the third watch-glass and thoroughly mixed.

A few slides, previously prepared by cleaning with ooo emery paper, are at hand. A small drop of the mixed fluids is placed on each slide, and a very thin film made with the spreader. The best film is selected (showing Newton's rings) and fixed with a saturated aqueous solution of corrosive sublimate, washed, and stained with carbol thionin. Placed under the field of the $\frac{1}{12}$-in. oil immersion, the film should show from 5 to 20 red corpuscles and a varying number of microbes. Successive fields (twenty or thirty) are counted, and the total number of red corpuscles and microbes counted and their proportion to one another struck. If the field contains very many corpuscles, due to the film being a little too thick, two diameters at right

* Sternberg's *Bacteriology*; Muir and Ritchie; D'Este Emery; Eyre.

† Made by Hoyer, or Hearson. ‡ Obtained from R. B. Turner.

angles marked on the eyepiece of the microscope with a blue glass pencil will facilitate counting by dividing the field into quadrants. As there are 5,000 million red corpuscles in 1 cc. of blood, the approximate number of microbes in 1 cc. of the emulsion can thus be ascertained. The large bulk of diluent saline is used in order to get a thin and countable film. The required strength of the vaccine can be finally obtained by dilution with 1 per cent saline. As a preservative, sufficient liquid carbolic acid is added to make a percentage of ·5.

The preliminary heating process to 60° C. has been given up by some workers, who merely add the carbolic after standardization has been made. It is found that the emulsion then becomes sterile after a few days. If, however, it is required immediately, the heating process is necessary. Prolonged heating, or heating over 65° C., destroys the therapeutic action.

It is advisable before adding the carbolic acid in the first method, or in the second method from day to day, to test the sterility of the vaccine by inoculating agar culture tubes with the emulsion and incubating for twelve to twenty-four hours. The vaccine is best preserved in bulk in Wright's orange-coloured vaccine bottles,* with rubber caps. These must of course be previously sterilized. Separate doses may be put up in vaccine bulbs,* using a sterilizable syringe.†

Appendix I.—Vaccines.

Tuberculin T.E. and T.R. and Béraneck's tuberculin can be obtained from Allen & Hanburys, Vere Street, Cavendish Square.

Staphylococcal vaccine, acne bacillus vaccine, streptococcal vaccine, and gonococcal vaccine are standard vaccines, and can be obtained from Parke, Davis & Co., who retail the vaccines made in Sir A. E. Wright's laboratory at St. Mary's Hospital. The therapeutic efficiency of these vaccines does not appear to vary.

A typhoid vaccine is now made, and, apart from the prophylactic advantages, is proving itself to be of considerable therapeutic value.

A coli vaccine should be autogenous (*vide* p. 88).

A pneumococcal vaccine is preferably autogenous, but if urgency demands may be obtained from Parke, Davis & Co.

Appendix II.—Rough Estimate for Fitting and Equipping the Laeoratory.

Laboratory Fittings—say £13 13*s*.

Fitting deal bench 72 in. by 30 in., with plate glass slab 30 in. by 36 in. painted white on under side, with black square 12 in. by 12 in., for microscope work. Incubators on same bench

Fitting deal bench 60 in. by 30 in. with sink, and connecting waste with lead syphon

Fitting 6-in. shelves for reagents

Fitting bracket for centrifuge

Laying on water to sink, and centrifuge, high pressure from main supply pipe to cistern

Laying on gas to benches

* Obtained from R. B. Turner.

† Record syringes, 1 cc., 3 cc., 20 cc. capacity, from Maw, Son & Co.

Four Baird and Tatlock's double gas unions, making eight points for attachment of rubber or flexible pipe
6 lengths of rubber or flexible pipe
2 Bunsen burners
1 blow-pipe and bellows (Baird & Tatlock)
1 small Fletcher's ring burner
1 microscope lamp (Baird & Tatlock's incandescent)
1 sink bridge (Hoyer), for staining and washing slides on
1 pair simple scales, with weights (metric)

Special Apparatus—say £37 10s.

1 microscope with sub-stage condenser, ×4 and ×8 eyepieces; and $\frac{1}{4}$, $\frac{1}{6}$, $\frac{1}{12}$ in. oil immersion objectives (English)
1 mechanical stage, Crouch's new pattern, from Maw, Son & Co.
1 centrifuge, Henry Crouch's model (water driven)
1 Hearson's incubator (gas) (6 in. by 6 in. by 7 in. inside)
1 Hoyer's or Hearson's opsonic incubator
1 fruit sterilizer for culture media with bottles: from any ironmonger
1 1 cc. record syringe with platinum needles
1 20 cc. record syringe with platinum needles, from Maw, Son & Co.

Glass Apparatus, etc.—say £3 10s.

1 Thermo-regulator for 60° C., from R. B. Turner, 11 Foster Lane, E.C.
Stock of glass tubing, various sizes
2 glass troughs for staining slides
Watch glasses
1 gross test tubes, Jena glass
1 gross slides
2 platinum wires mounted on glass rod
1 blue pencil for writing on glass
1 dozen teats for pipettes
1 dozen Jena glass 50 cc. flasks
1 gross ·5 cc. vaccine bulbs
2 dozen vaccine bottles and caps (Wright's)
1 test-tube holder
1 dozen Petri dishes, 3 in. diameter
1 thermometer, centigrade
Measures, 100 cc., and 10 cc.
1 dozen glass funnels
1 glass cutter
No. 000 emery paper
1 gross sputum specimen pots, with boxes and cork for postage

Chemicals—say £1.

From Baird & Tatlock, Cross Street, Hatton Garden.

Staining reagents, etc. Reagents for culture media. Witte's peptone, powdered agar, Brand's essence, etc.

REFERENCES.—[1]Wright, *Studies in Immunization* (Constable, London); [2]*Ibid.* pp. 426–433; [3]Butler Harris, "Treatment by Bacterial Vaccines," *Pract.* 1908, p. 654; [4]*Ibid.*; [5]*Lancet*, 1909; [6]For case, vide *Pract.* 1908, p. 650, [7]Wright, *Studies in Immunization*, p. 300, and *Clin. Jour.* May, 1906; [8]*Lancet*, 1906, and *Pract.* 1908, p. 719; [9]*Pract.* May, 1908, p., 650; [10]*Ibid.* 1908, p. 714; [11]*Path. Soc. Trans.* Jan. 17, 1905, vol. i.; [12]*Brit. Med. Jour.* June 26, 1909; [13]*Ibid.* June 26, 1909; [14]*Ibid.*; [15]*Studies in Immunization*, p. 425; [16]"Bacteriology of Common Colds," Benham, *Brit. Med. Jour.* Aug. 26, 1905, and Nov. 6, 1909; [17]Benham, *Proc. Brighton and Sussex Med. and Chir. Soc.* 1907-08, p. 84; Allen, *Lancet*, 1908; Bordet and Carmalt-Jones, papers read at B.M.A. meeting, Belfast, 1909; [18]MacWalters, "Vaccine Therapy in General Practice," *Pract.* Sept. 1909, p. 327.

HORMONES.

By EMIL NOVAK, M.D., Baltimore.

In his Croonian Lectures for 1905, Starling[1] presented certain interesting observations showing the importance of chemical factors in the correlation of function in the animal body. According to Starling, correlation of function by means of the nervous system is, from an evolutionary standpoint, a comparatively late development, being found only in the animal kingdom. In the lower unicellular organisms, for example, the only adaptation is to the environments, and this is brought about by means of chemical stimuli. The function of the nervous system in the higher animals is associated with rapid adaptation; but even in the higher animals, the nervous system does not completely replace chemical correlation, for when a slower reaction is required it is brought about through chemical influences. This theory can best be illustrated by recalling the observation upon which it is based.

It was the Russian physiologist Pawlow who first called attention to the fact that the injection of a dilute mineral acid into the duodenum provokes a secretion of pancreatic juice. This phenomenon he explained as being of a reflex nature, the efferent nerve of the reflex arc being the vagus. It was later demonstrated by Popielski that the same reaction can be obtained even after all the nerve connections of the gut have been severed, and hence this observer assumed that it must be of the nature of a local reflex, involving only peripheral nerve centres. Starling and Bayliss, however, have shown that the experiment can be so devised as to exclude any influence whatsoever on the part of the nervous system, either central or peripheral, and that even under these conditions the reaction is obtained. For example, the injection of the dilute mineral acid into a loop of gut, so prepared as to be attached to the rest of the body only by means of its blood-vessels, is followed by a flow of pancreatic juice no less marked than when injected into a normal loop of gut. Evidently, therefore, the stimulus to the pancreas is carried by the blood-stream. That the stimulating substance is not the acid itself, is shown by the failure of the reaction to occur when the acid is injected directly into the blood-vessels. It seems clear, therefore, that the active substance, or "chemical messenger," as Starling and Bayliss call it, is some substance elaborated in the intestinal mucosa under the influence of the dilute acid. Working on this hypothesis, they scraped off some of the epithelium of the bowel, rubbed it up with acid, and, injecting the filtered mixture into the blood-stream of an animal, were rewarded by obtaining a flow of pancreatic juice more profuse than any which had been seen in their other experiments. To this chemical messenger they have given the name of "secretin," and its importance lies in the

fact that it is only one of a large number of similar chemical messengers which, travelling by way of the blood-stream from one organ to another, bring about a correlation of the functions of the organs concerned. To this large and important group of substances Starling and Bayliss have given the name of " hormones."

On the whole, therefore, these hormones correspond to the substances which we have hitherto been accustomed to speak of as internal secretions, the latter term dating from the time of Claude Bernard. Originally, the idea of internal secretions was associated only with the so-called ductless glands, but we know now that many other tissues and organs, some with definite external secretions, also possess the function of internal secretion. It is not my purpose in this brief *résumé* to take up in detail the known facts concerning the many hormones with which we are already more or less familiar. The old idea that the internal secretions are substances of intangible, ferment-like nature has been very largely dispelled, for the few hormones which have been isolated possess all the characteristics of well-defined chemical compounds. For example, the hormone of the medulla of the suprarenal bodies, is the well-known substance adrenalin, now so well established as a therapeutic agent. In other cases, even where the hormone has resisted all attempts at isolation, it has been possible to study its physiological action with a considerable degree of accuracy. A favourite method consists in determining the results of the withdrawal from the system of the hormone under study, usually by removal, in animals, of the organ concerned. In this way much has been learned concerning the hormones of the thyroid, parathyroids, suprarenals, and the pituitary body. Other methods of observation and investigation have also yielded valuable results, as in the case of the pancreas, testes, and the female reproductive organs. The bearing of the hormone theory upon the generative organs of the female is considered at some length by the writer[2] in another article.

From a practical standpoint the further study and development of this interesting theory is sure to yield many valuable results. As Starling[3] has pointed out, our entire modern system of drug therapy is based upon the idea that the functions of the body can be influenced by chemical means. From another standpoint, again, it would seem obvious that our knowledge of such diseases as exophthalmic goitre, Addison's disease, acromegaly, tetany, etc., must be immeasurably increased by advances in our knowledge of the characters and functions of the hormones concerned, while it is by no means improbable that many other diseases of obscure causation may later be explainable in terms of the hormone theory.

REFERENCES.—[1]*Lancet*, 1905, ii. 319, 423, 501, 579; [2]*Jour. Amer. Med Assoc.* 1908, l. 835 to 840; [3]*Surg. Gyn. and Obst.* 1909, ix. 344 to 350.

INJECTIONS OF SEA WATER.

By Dr. ROBERT-SIMON, M.D. Univ. Paris,
Member of the Therapeutical Society of Paris.

Quinton's[1] theory as to the sea-water origin of animal life is to-day known everywhere. Geology and palæontology agree in admitting that animal life first appeared in the sea; and the analysis of the blood serum and the ash of every animal entering into the zoological series shows that the mineral composition of the medium necessary to cellular life is the same as that of the original seas. Quinton has shown that the primordial oceans contained ·8 per cent of salts; since then they have become concentrated, and now contain 3·3 per cent of salts, while the living medium of organized beings has *retained* its saline concentration at ·8 per cent. Quinton expresses this maintenance of the primitive environment thus, in his *law of marine constancy*: "Animal life, which appeared as a cell in seas of a well-determined saline concentration, in order to obtain its optimum cellular activity, always has a tendency throughout the zoological scale to keep the cells of which each organism consists in the aquatic marine conditions of their origin."

This novel conception of the animal organism as "an actual sea aquarium, in which the cells of which it is composed continue to live under the aquatic conditions of their origin," could not fail to encourage experiments in therapeutics. Sea-water treatment has in various ways been submitted to trial for a long time; the waters at Salies-de-Béarn, at Salins-Moutiers, Balaruc, Bourbonne-les-Bains, at Nauheim, Niederbronn, Wiesbaden, and so on, derive their minerals from beds of salt of oceanic origin. Finally, there are the numberless seaside "cures." It remained to try the more immediate application of sea-water by subcutaneous injection. From our very first attempts this proved to be a remarkably powerful tonic and alterative, restoring sleep, appetite, and digestion, correcting neuroses of long standing, cicatrizing wounds, whether ordinary or specific, modifying the lesions of pulmonary tuberculosis, checking marasmus and gastro-enteritis in infants, and manifesting a powerful action on certain dermatoses. It called for methodical and detailed study, which after five years makes it possible to state the indications and contraindications, the results and the action, of what we have termed "the sea-water cure."

Preparation of Sea Water for Injection.

Sea water used for treatment must be collected not less than 20 miles from shore, in water 10 metres deep, and at a distance from any port or from any current flowing from a port. It must be collected in sterilized bottles, open only for the few minutes needed to fill

them. This bottling should be done only from a vessel which has been stopped, and from the fore part of the vessel, in order to avoid contamination by oil, coal, etc. Fresh water for diluting the sea water must be bacteriologically pure spring water containing a minimum of mineral. The mixture should consist of sea water 2 parts, fresh water 5 parts. A fluid isotonic with the blood is thus obtained, which we call "isotonic sea water" or "sea-water plasma." This must next be filtered through a porcelain filter of the Pasteur type. All vessels and filters used in this process, as well as the glass flasks to contain the plasma, must be sterilized before every preparation. It is of the highest importance to avoid the use of heat in sterilizing sea water, for it loses its activity when heated. This is fully proved both by laboratory experiment and by clinical experience.

The flasks, sterilized and closed at one end, must, after being filled, be sealed in the flame at the open end, and are then ready for use. For convenience in any and every case, flasks of 50, 100, 200, and 300 cc. should be made: graduated flasks of 300 or 500 cc. are especially useful for hospital or dispensary practice, where several consecutive injections can be made, the needle being heated in the flame before each injection. As the solution loses much of its activity with time, it is important to employ water that has not been collected more than three weeks.

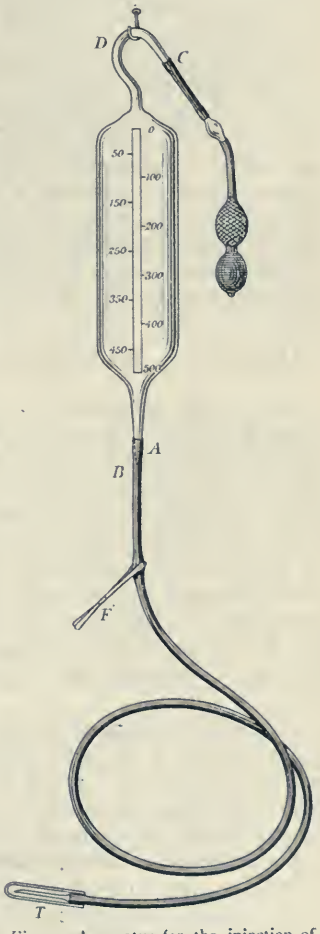


Fig. 4.—Apparatus for the injection of sea water.

Technique.

The injection is performed with a rubber tube 1·5 metres in length and ending in a platinum-iridium needle 3 cm. long: this latter should be protected by a glass tube *T* (*Fig.* 4). The tube and needle must be boiled before being connected with the flask. The connection is made as follows: (1) File the lower end of the straight tube *A* of the flask, break its point, and join it with *B*, the free end of the rubber tube. (2) File the end of the bent tube *C*, break its point, and hang

up the flask by the bend in the tube at *D*, about 1 metre above the patient. To start the flow, the bellows of a thermo-cautery attached to the end *C* is useful; it is advisable to interrupt the tube of the bellows by a glass tube with a bulb packed with sterilized cotton-wool, to filter the air. (3) The flask being hung up, remove the tube *T*, and allow the fluid to run until the rubber tube is quite empty of the boiled water and the air it contains. Make sure it is salt water which is running, by tasting drops on the back of the hand periodically; then stop the flow with the clip *F*.

The best point for injection lies behind the great trochanter. After the skin has been cleansed with alcohol, the needle should be driven in to its whole length perpendicular to the skin surface (except in very thin persons). If this should cause pain, withdraw the needle a few millimetres. Subsequent injections should be made at the same spot, so as to avoid a repetition of the pain which arises twelve hours after the first injection from stretching of the tissues. After the injection, the needle-wound should be covered for a minute or two with a pledget of cotton-wool soaked in alcohol; it will have closed up by that time. Collodion irritates the skin or fails to stick.

Therapeutic Results and Methods in Various Disorders.

The results attained with sea-water plasma are of different types. From the outset it proves itself an extremely powerful tonic, so certain that one never need hesitate to commit oneself regarding its efficacy. The benefit is indeed immediate and quite obvious, even to the eye of the layman; the increase of weight, the return of appetite and sleep, the relief of pain, are facts constantly observed. The effect on nutrition is particularly remarkable: digestion improves, the bowels become regular, and the whole general condition picks up in consequence. This alone shows the use to which this method can be put in the treatment of neurasthenia, atonic dyspepsia, and all those victims of overwork and depression so characteristic of our present age.

Let us now examine in detail the various diseases in which sea-water plasma is of use, taking first those in which the treatment exercises an absolute, rapid, and radical action. These are the acute gastro-intestinal affections of infancy, the digestive disturbances of adult life and the neuroses dependent thereon, and skin affections.

Acute Infantile Gastro-enteritis.—The rapid action of sea-water plasma is seen to best advantage in new-born infants with gastro-enteritis and malnutrition. Even in the most desperate cases rapid recoveries, amounting to an actual resurrection, are often witnessed. Not even in the gravest cases is the use of sea water contraindicated. Moreover, in 80 per cent of the cases, babies wasted to the last extreme, having vomited everything for weeks—first milk, then vegetable broths, and finally even boiled water—will, after the first injection, take and digest a meal of milk suitable in quantity for a normal child of the

same age and weight. Further meals at two- or three-hourly intervals are similarly tolerated, and after a few days the diarrhœa stops. Under such conditions a diet of water becomes useless and even harmful for a child who needs, and can take, proper feeds. True, many infants get well of gastro-enteritis under other methods of treatment; but none of these can compare with the numerous cures to be ascribed to the use of sea-water plasma (which experimentally and clinically has shown itself twice as active as normal saline solution). In our "Sea-Water Dispensaries for poor people" in Paris, where the children are not brought to us until they are at the last gasp, our mortality is only 2 or 3 per cent. The treatment has often enabled us to recall to life little patients with subnormal temperature, general subicteric tinge, anuria of twelve to twenty-four hours' duration, and in some cases abolition of the corneal reflex.

Two important recommendations are: (1) To avoid all so-called antiseptic treatment, based on the use of poisonous chemicals, which would only antagonize the detoxicating action of the sea-water plasma; (2) To cease the washing out of stomach and bowel, a practice which merely acts as a useless irritant of the digestive tube, and is sometimes followed by collapse. In enteritis with constipation, allow a restricted washing or a suppository every second or third day at the outset of the treatment.

Technique and Dose.—On account of the frequent soiling of the gluteal region in infants, always inject them under the skin covering the scapula. In infants weighing from 4 to 10 kilograms, the dose should be 25 to 30 cc., every two or three days (except in very grave cases, where a daily injection should be given, sometimes in increasing doses of 50, 70 and 100 cc.). In infants weighing less than 3 kilograms, injections of 10 cc. at the same intervals will suffice; if these are without effect, 15, 25, and 30 cc. may be used without fear.

Gastro-intestinal Disorders in Adults.—Here we have to deal with constipation and muco-membranous entero-colitis as well as with the gastric atony which is so common an accompaniment. Sea-water plasma acts on all three in a similar fashion, no doubt through the medium of the nervous system. Sometimes on the day after the first injection, more often after five or six, the slime and the false membranes disappear, together with the expulsive pains; the motions become regular, easy, and well-formed; there is no longer any distention or sense of weight after food, even though a rigid scheme of diet has not been imposed upon the patient.

Treatment.—In these cases, the dosage of sea-water plasma is of the greatest importance. In fact, two or three years ago the writer's successes were not higher than 60 or 70 per cent, while now they reach 90 per cent. There is therefore a definite rule to follow, namely, to begin with injections of 30 cc. every two or three days (20 to 25 cc. in very nervous women). There should be neither febrile reaction nor general malaise after the injections; if there is, diminish the dose or increase the interval, or both. If there is neither reaction nor

any improvement in the digestive symptoms, the dose should be raised to 40, 50, sometimes 70, very occasionally 100 cc. The treatment need not cease on account of menstruation. The injection may be given at any time of day, before or after meals, in all cases.

What are the conditions obtaining in the 10 per cent of cases who are not improved? By comparing the abdominal physical signs noted at repeated examinations of every case treated in this way, it is possible to discover that it is in spastic constipation with old-standing contracture and enteroptosis that failure occurs, even when the latter is corrected by an abdominal belt: it is only in such cases that the writer has sometimes failed, and there are a number of small symptoms which generally indicate the probable harmfulness of the treatment—giddiness, headache, malaise, sleeplessness, præcordial pain, loss of appetite, furred tongue, pyrosis, flatulence, and above all loss of weight with aggravation of the constipation and enteritis; such symptoms contraindicate the prosecution of treatment when no improvement is apparent. On the other hand, if the treatment is well borne, all the gastro-intestinal phenomena will diminish progressively, and cure is usually complete after a course of twenty to thirty injections.

There is a very common affection of women amenable to the same method of treatment, to which Quinton and the writer have given the name "gynalgia"; the characteristic syndrome consists of painful menstruation, menstrual migraine with rachialgia, and constipation or enteritis. These symptoms yield quickly to sea-water injections, and at the end of a month's treatment, with doses similar to those above, the periods are easy, painless, and free from migraine.

It has already been remarked that the same good effects are seen in neurasthenia and the allied condition, nervous prostration. It need only be added that in these conditions the dose may be quickly raised to 50, 100, or 150 cc., every other day, except where gastro-intestinal symptoms indicate more moderate doses.

In **Anæmia** and **Chlorosis** systematic blood examinations show a progressive increase in the hæmoglobin and the red and white corpuscles; the general state improves also. The same doses should be used as in the preceding disorders.

Diseases of the Skin.—Almost all physicians agree in forbidding those who suffer from inflammatory lesions of the skin to stay at the seaside; it seems as if the sea air, laden with salt, were harmful to such patients, especially to such as have eczema. It is quite otherwise, however, with the injection of sea water, and we may regard its action as fairly established in cases of eczema, psoriasis, varicose ulcer, and wounds of the skin, whether simple or specific.

Eczema.—Success is attained in about 70 per cent of the cases, and is sometimes strikingly rapid. Itching and exudation often stop or very sensibly diminish the day after the first or second injection. One of the advantages of this treatment is that in cases of eczema of the

hands and forearms the patient is soon able to resume work. He gets well while he works, instead of being put out of action by dressings applied to his limbs.

Treatment in Adults.—The importance of properly assessing and timing the injections is nowhere as great as in eczema. Practitioner and patient must actively co-operate, the latter observing carefully the effect of each injection, whether it is improvement, or reaction, or relapse after two or three days of improvement such as usually follows injection. At any rate, for the first six injections the dose for an adult should never exceed 30 cc. This is of the very greatest importance, for while the method thus used can produce in eczema results remarkable for their potency and rapidity, the use of too full a dosage may bring about a temporary exacerbation of the disorder. The method of procedure should be as follows: 30 cc. should be injected every third day to begin with. There is often an immediate improvement (diminution of itching, of discharge, etc.); this being so, it is enough to go on with the same dose at the same interval. If, on the other hand, an outburst of inflammatory reaction follows within twenty-four hours of the injection, it means that too large a dose has been given; and it must be either cut down to 20 or 25 cc., or given at longer intervals of, say, three or four days. On the other hand, if after two or three injections neither reaction nor improvement is noted, it is because the treatment has not been vigorous enough; it is then time either to increase the dose to 40, 45, or 50 cc., or to shorten the intervals to two days instead of three. If this causes reaction, the dose must be lessened or the original three days' interval resumed. Further, the patient can often give a reliable index as to the interval suitable for his case. As a matter of fact it often happens that the injection of 30 cc. causes a striking improvement on the same day and the day following, with a relapse on the third day. This points to the need for an injection on every other day. In a very few instances where no effect one way or the other is produced by doses of 30 to 50 cc., the result of large doses, 70 to 100 cc., may be tried.

Important Suggestions.—(1) Do not confuse the relapse which often occurs on the second or third day, after twenty-four or forty-eight hours' improvement, with the reaction sometimes seen the same day as the injection, or on the following morning. Such a mistake would lead to a lengthening of the interval when it ought to be shortened, and *vice versa*. Discriminate between the phenomena of reaction and the attacks of eczema which the patient sometimes brings upon himself by indiscretion (using hot or acidulated water, soap, etc.).

(2) If the eczematous areas have to be covered by reason of their position, use nothing but dressings wet with cold boiled water. Never use hot water, or water containing boric acid or any mineral salt. Soap must not be applied, nor boric vaseline, nor any other irritating unguent. If something must be applied, use oxide of zinc 1 part in fresh pork fat 20 parts.

(3) Examine the patient's dietary, and enjoin moderation in the quantity of food.

Treatment in Infants.—In eczematous infants the dose must never exceed 10 cc., at least for the first six injections; these should be given every third day. If no reaction occurs and improvement is slow to show itself, the injection may be given every other day; if this causes a reaction, the interval should be lengthened again to three or even four days. If after six injections of 10 cc. each, the last three on alternate days, neither reaction nor improvement is seen, doses of 20 cc. every other day, or of 30 cc. on every second or third day, must be adopted. In infants weighing less than 4 kilograms smaller doses (5, 6, 7 cc. for instance) must be used to begin with.

The general suggestions are the same as for adults, with this added, that the inflammatory reaction may take the form of a greatly increased exudation from facial lesions. Care must therefore be taken to guard the infant's eyes from the entrance of this exuded fluid, otherwise a purulent conjunctivitis may result. For this purpose thick tampons of cotton-wool soaked in cold boiled water may be used with a bandage by way of support.

Psoriasis.—In 50 or 60 per cent of all cases psoriasis is improved by the injection of sea-water plasma, sometimes to a remarkable degree. The itching, which is sometimes a feature, is favourably influenced. In psoriasis the stage of reaction, which is common in eczema after an excessive dose, is rarely met with. It is therefore safe, as a rule, to go on quickly to doses of 100 or even 200 cc. in adults, at an average interval of three days: large doses of 300 cc. are sometimes needful. Nevertheless there is need for caution, as some persons show a reaction to the injection.

Ulcers of the Skin, Simple or Specific.—*Varicose Ulcers.*—Injections of sea water bring about a definite diminution of pain and a general improvement in varicose ulcers; and in contrast to the conditions obtaining during the ordinary treatment, the patient can walk about meanwhile. Moderate work, short of fatigue, does not interfere with recovery. In some cases the ulcers cicatrize quickly.

If there is eczema as well as ulceration, the treatment should be on the same lines as for eczema. If it is ulceration alone, the initial dose of 50 cc. can be quickly increased to 100 cc. every other day, then to 200 cc. every third day. Use simple dressings wet with cold boiled water, and renewed daily.

The same doses and remarks apply to simple cutaneous wounds.

Syphilis.—Sea-water treatment is a valuable adjuvant to mercury in the often protracted ulcerations of the tertiary stage. Periodical treatment with mercury must not be abandoned, although the writer has been able by the use of sea water alone to cicatrize lesions which would not yield to mercury.

Cutaneous and Surgical Tuberculosis.—In cases of lupus, where scraping, cauterization, radiotheraphy and phototherapy have failed, we have seen the sea-water treatment succeed. Similar results occur

ILLUSTRATIVE CASES
SHOWING THE RESULTS OF
SEA-WATER INJECTION TREATMENT

ROBERT-SIMON, M.D.

PLATE I

ACUTE GASTRO-ENTERITIS IN A CHILD

Patient aged 3½ months. • Born two months prematurely. • One month of vomiting, a fortnight of diarrhœa, with eight offensive stools per twenty-four hours.

First photograph—August 27th, 1908. Weight, 2·95 kilograms. Treatment: 19 injections of 10 to 30 cc. from August 27th to December 5th, 1908. Weight on September 3rd, 3·6 kilograms, a daily increase of 100 grams. Weight on December 5th, 4·88 kilograms.

PLATE II

ACUTE GASTRO-ENTERITIS IN A CHILD—*continued*

Second photograph—March 25th, 1909. Cure maintained. Weight normal for the age = 7·95 kilograms

PLATE III

GASTRO-ENTERITIS AND WHOOPING-COUGH

In a full-term child, eight months old. One month's whooping-cough, with twenty to twenty-five attacks in twenty-four hours, vomiting with each attack. Constipation from birth.

First photograph. May 6th, 1902. Weight [illegible]

Second photograph—July 13th, 1909. Vomiting and constipation disappeared; sleep returned after 3 injections; paroxysms disappeared after 7 injections.

PLATE V

DYSPEPTIC CACHEXIA

Patient aged 20. Obstinate constipation with enteritis five years. Vomiting once or twice daily for two years. Amenorrhœa four years.
When treatment began, milk, vegetable soup, and rice water were all vomited.

First photograph—May 13th, 1908.
Weight 23·85 kilograms.
Vomiting stopped after 5 injections.

Second photograph—July 9th, 1908.
Weight 31·5 kilograms.

Third photograph—August 15th, 1908.
Weight 42·5 kilograms.
Patient absolutely cured by 26 injections of 30–80 cc.

CHRONIC GASTRO-ENTERITIS AND IMPETIGINOUS ECZEMA

Onset at three months. Scabs and discharge.

First photograph—April 8th, 1908. Treatment: 18 injections of 10 to 20 cc. *Second photograph*—May 27th, 1908. Result: cured, and remaining well when seen in February, 1909.

PLATE VII

LICHENOID ECZEMA OF SIXTEEN YEARS' DURATION

Patient aged 66 years. The trouble had been continuous from 50 years onwards. There were itching and discharge.

First photograph—June 29th, 1908. Treated with 15 injections of 30 to 50 cc.

LICHENOID ECZEMA—*continued*

Second photograph—July 30th, 1908. Cured August 10th, 1908. Still in good condition when seen January 23rd, 1909.

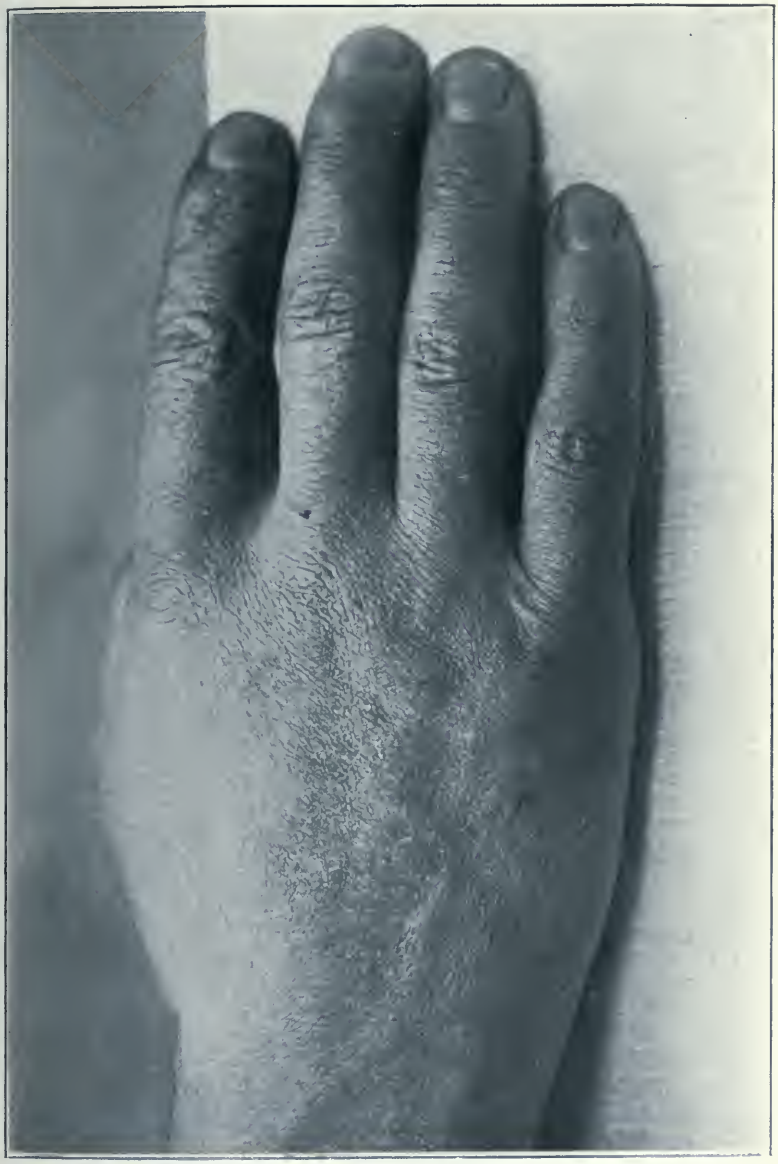
PLATE IX

ECZEMA OF SEVEN MONTHS' DURATION

Patient aged 27 years.

First photograph—August 20th, 1908. Treated with 17 injections of 30 to 100 cc.

ECZEMA—*continued*



Second photograph—October 9th, 1908. Permanent cure resulted.

PLATE XI

PSORIASIS EXFOLIATION OF SIX YEARS' DURATION

Four months previous to this photograph it became general, with œdema and cutaneous hyperæsthesia of the lower limbs.

First photograph—July 30th, 1908. Treated with 15 injections of 50 to 120 cc.

PSORIASIS EXFOLIATION—*continued*

Second photograph—August 20th, 1908 : the œdema has gone.
Complete cure September 18th, 1908.

PLATE XIII

PSORIASIS GUTTATA IN A BOY

Aged 13½ years; with a psoriatic inheritance. Onset at 13 years.
First photograph—December 19th, 1907. Treatment: 8 injections of 30 to 70 cc.

Second photograph—February 5th, 1908. Cured, and still well when seen March, 1909.

PLATE XV

TUBERCULOUS LUPUS OF NINE YEARS' DURATION

Patient 22 years of age.

First photograph—February 12th, 1908. *Second photograph*—July 23rd, 1908.

Treatment by 53 injections of 50 to 250 cc. resulted in cicatrization of four-fifths of the diseased area.

Patient 29 years of age.

First photograph—March 2nd, 1907. *Second photograph*—April 13th, 1909.

After 12 injections of 30 to 50 cc., a cure resulted, leaving a cicatricial pigmented surface.

PLATE XVII

ECZEMATIFORM TUBERCULIDES

Patient aged 21 years. Lasting, with remissions. ten years.
First photograph—February 17th, 1908. Treated with 3 injections of 30 to 60 cc.

ECZEMATIFORM TUBERCULIDES—*continued*

Second photograph—March 9th, 1908. The lesions cicatrized, and relapsed no more.

PLATE XIX

TERTIARY SYPHILIS

Patient aged 51 years. The lesion had existed for a year in spite of mercurial injections.

First photograph—January 24th, 1908. *Second photograph*—February 22nd, 1908.

in tuberculosis, arthritis, and adenitis. These are the types of case treated in seaside sanatoria ; but injection can be carried out anywhere, in the city or country, and it acts twice as quickly, facts of importance from social and economic points of view.

For syphilis and tuberculosis inject 50 to 200 cc., or even 300 cc. if needed, every third day.

Pulmonary Tuberculosis.—The general phenomena alluded to above as resulting from sea-water treatment (return of strength, sleep, and appetite, improved digestion, etc.) foreshadow the possibility of injections of sea water being helpful in the treatment of consumption. In the quiet type, where acute changes are absent, these subjective results may be seen with doses of 30 cc., then of 50 cc., rarely of 100 cc., as well as increase of weight, and lessened cough and expectoration ; while physical examination shows cicatrization around the diseased areas. In afebrile cases with cavitation, the writer has often seen even the most purulent cavities dry up. There is therefore a large class of tuberculous patients, those free from acute changes, in whom sea-water treatment is justifiable.

Some writers, including the present one in earlier days,[2] have spoken of fever lowered and hæmoptysis checked ; but larger experience fails to justify this view. In acute tuberculosis some fortunate results have been recorded, and perhaps others may yet be ; but in actual practice it is hoped to see the treatment limited to those who are free from active disease ; these alone stand to gain by it.

Success must be further recorded in some cases of **Infantile Palsy, Chorea,** and **Exophthalmic Goitre.**

In conclusion, a few words must be said about dechloridization as opposed to the sea-water treatment. Neither theory must be pushed too far. Although in two cases of Bright's disease the writer succeeded in reducing the weight by 10 and 7 kilograms in three and five weeks respectively by using sea-water injections to remove œdema, such cases must be considered exceptional, and he does not at any rate propose to fill renal patients with chlorides. On the other hand, in chlorosis, where albuminuria to the extent of several centigrams is so common (owing to the hæmolytic action of chlorotic serum), he has noted disappearance of the albumin and cure of the patient under sea-water treatment. In these cases the albumin is estimated daily, and the injections are discontinued if it increases, which is a rare event.

The writer has never seen sea-water treatment, however prolonged, induce nephritis ; on the contrary, it generally causes great diuresis at first ; and this wholesale supplanting of cytotoxic substances by sea-water plasma doubtless furnishes the key to the *modus operandi* of the treatment.

In fact, if we realize that digestive troubles, whether acute or chronic, and the neuroses and dystrophies arising from them, diseases of the skin, even tuberculosis itself, are only different forms of reaction on the part of the organism to biochemical or microbic injury, which

disturb its humoral equilibrium and tamper with its cellular vitality: if we further reflect that this disturbance of cellular life either has its source in a primary injury to the nerve cell or else reacts upon the nerve cell soonest, as the most sensitive of all cells: it will be readily understood that diseases (or perhaps one should say functional disorders) differing in their symptoms, but owning a common etiological basis, may be modified by a common method of treatment; that functional equilibrium may be re-established by a common therapeutic agent, if that agent be capable of restoring to the cells their vital and natural environment. Further, it will seem less astonishing to see a single therapeutic measure, albeit reasonable and natural, counteracting diseases which, though they differ in name and appearance, arise from a common origin, an organic intoxication; and to see the superiority of the sea-water treatment over treatment by drugs, all of a more or less toxic nature, clearly demonstrated, so that the injection of sea-water plasma may fairly claim and receive first place among means for detoxicating the living body.

REFERENCES.—[1]*L'Eau de mer, milieu organique* (Paris: Masson, 1904); [2]*Applications thérapeutiques de l'eau de mer, Encyclopédie Léauté* (Paris: Masson, 1907).

[*Plates I–XIX*, from photographs of patients, illustrate some of the striking results claimed for this method of treatment.

Experiments with sea-water injections have been made by Dr. Percy Wilde at the Lansdown Hospital, Bath. The water was collected under medical supervision in the Atlantic, in aseptic vessels, and passed through a Pasteur filter. It was mixed with sterilized distilled water in the proportion of 3 parts to 5 of distilled water. Although this is a somewhat stronger solution than used by Dr. Robert-Simon, the injections proved absolutely painless. A syringe holding 50 cc. with an ordinary hypodermic needle attached, was found more convenient than the injection of the fluid by gravitation, as a large saving of time was effected. Messrs. R. Sumner & Co., of Liverpool, organized the collection of the sea-water, and supplied the syringes used in the experiments. These were mainly conducted with a view to establishing the physiological action of the "marine plasma." In the majority of cases the effect was distinctly tonic; in some there was a feeling of lassitude produced, which precisely resembled that which the same subjects felt on going to the sea-side. In cases of subnormal temperature, the effect was a *gradual* rise of temperature towards normal. No known drug has given such good results in lifting the subnormal temperature. This would point to a direct feeding of the protoplasmic cells, causing increased activity and giving the organism greater power of resistance. No increase of solids in the urine was observed. Experiments on this point have been so far negative. The effect upon general nutrition was decided; a gain of weight was found in all cases where the body-weight was below normal.

The general conclusion, which can only be confirmed by more prolonged observation, is that injections of marine plasma constitute a valuable therapeutic resource in all conditions which depend for their continuance on a general adynamia, and whi h need some greater power of resistance on the part of the organism than can be stimulated by ordinary tonics.

Further experiments were made by giving a dessertspoonful of sea water in half a tumbler of distilled water thrice daily before meals. This dose is not at all unpalatable, and very distinct tonic effects were observed. A marked effect in clearing up chronic nasal catarrh was obtained in this way.]

RADIOLOGY AND ELECTROTHERAPEUTICS.

BY

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In the work of the past year the striking feature is the great prominence that has been given to radium and ionic medication in the ever-advancing field of physical therapeutics. The boom in radium that followed the lecture by Sir Frederick Treves at the London Hospital early in the year has been quite remarkable, and later we are promised the establishment of a Radium Institute where patients of all classes can be treated. The present price of radium is such that it would never pay any individual to invest in a quantity of this rare substance that would be of any real and practical value in therapeutics. The outcrop of articles on radium treatment, following on the lecture above referred to, was really prodigious, and the most important of these are referred to later on in this chapter.

APPARATUS.

In the matter of apparatus the feature of the year has been the development of the high-tension transformer coupled with a rectifier for the high-voltage current, so that the X-ray tube is supplied by a unidirectional, though pulsating, current. This is of course the same as the Snook Röntgen apparatus made in this country by Newton & Co., and described briefly in the *Medical Annual* for 1909. While other manufacturers are putting similar machines on the market, it is only fair to state that the credit of perfecting the idea is due to Mr. Snook, of Philadelphia, and that the instruments supplied by others are copies, and possess no advantages over the original.

While this instrument, or some modification of it, is bound to supersede the induction coil where heavy work is to be done, it is as well to remember that the coil outfit, suitably modified, is equally capable of doing instantaneous work, and it is a mistake to think that once one of the new forms of apparatus is obtained, difficulties will disappear. While we do not wish for a moment to say anything likely to interfere with the sale of an apparatus, yet we feel justified in reminding any of our readers who may be thinking of installing one of these instruments, that they are decidedly noisy—so much so that, as a rule, some means must be taken to minimize it. This may be done by enclosing it in a felt-lined air-tight cabinet, or it may be placed in a cellar, provided the latter is perfectly dry. If put in an outhouse care must be taken that it does not prove a nuisance to

neighbours. Further, if it is some distance from the X-ray tube the latter often behaves in a very curious fashion, as if there were some oscillations going on in the wires. These, however, can be damped out by interposing a water resistance in each of the leads to the tube. The instrument is of course in the early stages of its development, and there is not the least doubt that the comparatively trifling faults here referred to will soon be remedied.

No special development has taken place in X-ray tubes. The large tube with external radiators, made by Gundelach, has been further improved during the past year. It will withstand almost any current up to 80 or 100 milliampères for a short time—say one second—and

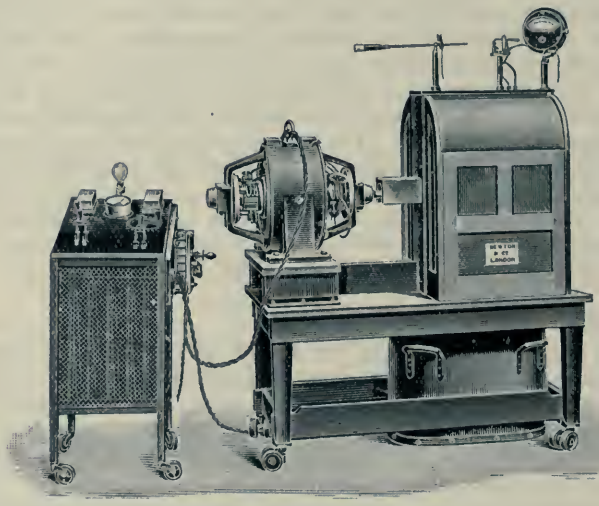

Fig. 5.—Snook's Apparatus.

so far as our experience goes it is the only one on the market that will carry a current of two milliampères for a practically indefinite period, and instead of getting softer, the vacuum gradually rises. We found, however, that after running ten minutes or so the radiators became so hot that the solder attaching them melted and fell off. We feel sure it would be an advantage to use a harder solder, and also to see that the whole surface of the blades of the radiators was *rough*, and not more or less polished, as in all the tubes of this type we have examined.

When first obtained, this tube may be used for treatment with great advantage. After its resistance has reached that of a three to four-inch spark gap, it will be found to give most excellent results in radiography. The regenerating device on this tube is on a new principle. It consists of two layers of material capable of giving off gases but separated by glass—forming a condenser. It can be set to work automatically if desired, but the regenerated vacuum is

much more stable than with most other forms, and an occasional regeneration is all that is necessary.

Another tube, known as the "Burger," has been brought to our notice during the past year. It is more or less of the Muller heavy anode type. These tubes are exceedingly well made, and, so far as we have examined them, seem to have been exhausted with great care. What struck us was the fact that they possessed a remarkable steadiness of vacuum, even when new and worked with fairly strong currents. With the whole antikathode red hot the penetration of the tube fell off very little. The fluorescence is rich in colour, and the whole behaviour of the tube very pleasing. It is to be hoped that these good qualities will be maintained in future supplies, but it is an unfortunate fact that no sooner do some makers get a reputation for making good, reliable tubes than the quality begins to deteriorate.

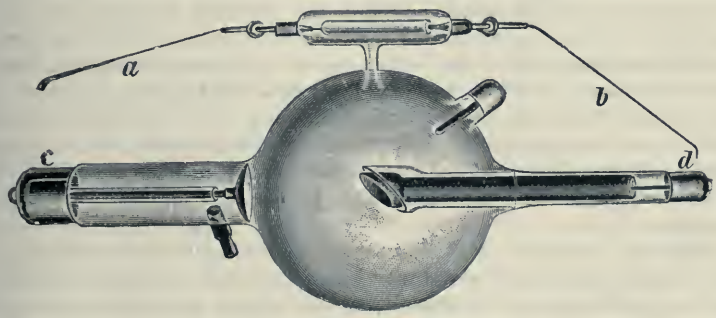

Fig. 6.—Gundelach's "Moment" Tube.

Instantaneous radiography continues to exercise its fascination for many workers. This becomes comparatively easy to those who have a Snook apparatus or a suitable coil worked from the main through a multi-anode electrolytic break. We must say, however, that considering the damage to tubes and the expense incurred, the results do not seem to justify the means. While in selected subjects a tube can be used for many exposures, it is yet a fact that when we begin to take instantaneous radiograpns as a matter of routine, the tubes do not last very long, and failures, or at least unsatisfactory radiograms, are frequent. Nevertheless, we are still of the opinion that as in ordinary photography, so in radiography, the short or instantaneous exposure will ultimately prevail. Dessauer[1] claims by his modifications to be able to make serviceable radiograms with exposures of less than $\frac{1}{100}$ second.

With regard to X-ray measurement, we are practically where we were. This question was thoroughly threshed out at the Amsterdam Congress,[2] the proceedings of which are worth referring to.

A novel suggestion comes, however, from Strauss,[3] whose method is a modification of Kienböck's. The sensitive strip is exposed to the

tube while in a developing solution—a special form of vessel having been devised to facilitate this. The paper thus becomes darker while the development is going on, and with a set of standard tints the exposure can be stopped the moment the desired dose has been given. The strip is then washed, fixed, and pasted into the record book. To get at the amount of dose received at any given depth, aluminium screens are used to cover the strip. There is no doubt this method is an advance on the original one of Kienböck, and removes one serious disadvantage of the latter, viz., that one could only ascertain the dose after it had been given, whereas this scheme enables the operator to watch the administration as it is taking place.

So far as we have heard, no new cases of X-ray dermatitis have cropped up, and with the means now in use for protecting both operator and patient, undesired X-ray dermatitis should never be heard of again. For some years now we have been of opinion that the X-ray tube was not solely responsible for the changes produced in those working with them, but that something of a more or less deleterious nature was given off by the wires carrying the high-tension current. It is interesting now to find that wireless telegraph operators[4] are complaining of various symptoms, affecting the eyes for the most part, such as conjunctivitis, eczema of the eyelids, wrist, etc., and one official suffered from painful palpitation of the heart which came on after working for any length of time at the instruments for sending messages.

While on this subject of radio-activity, we may draw attention to the lectures of Lazarus-Barlow[5] on radio-activity and carcinoma. He found that certain substances, tissues of the body, etc. (liver and kidney), when dried and powdered, will affect a photographic plate in the dark, while other tissues (spleen and lung) do not. This he terms skotographic action. He has found it more highly developed in females than males, and to vary at different ages, being highest at 55 or thereabouts. He also found this skotographic power in carcinomatous tissue, and in his summary goes on to say that female carcinomatous tissue has a higher skotographic value than male; and that the existence of a mass of carcinoma in a tissue modifies its normal skotographic value. "I have found that certain substances commonly supposed to be causally related to carcinoma possess the skotographic power to a high degree (cholesterin gall-stone), while others are devoid of it (clay pipe, paraffin). I have endeavoured to throw some light upon the nature of the skotographic action manifested by animal tissues and certain other substances, comparing their behaviour with that of woods in which the action has been regarded as dependent upon the formation of hydrogen peroxide, and with that of recognized radio-active substances. On this point I have adduced evidence showing that the animal tissues and other substances under examination cannot, so far as their action upon a photographic plate in the dark is concerned, be grouped conclusively with the recognized radio-active substances or segregated into a class such as that formed

by the woods, and believed by Russell to affect a photographic plate in the dark by means of a purely chemical action. They occupy an intermediate position, and have affinities with the woods on the one hand and with the recognized radio-active substances on the other. Lastly, MacCormac, working in my laboratory, has shown that bacteria may be divided into groups according to their skotographic power, and that the only group which acts in this way with constancy and to a marked degree is a small one, which includes the pyogenetic staphylococci and the bacilli of tuberculosis and diphtheria."

How far these observations may serve to throw light on the origin of cancer, the future alone can tell.

Our American cousins continue to follow up X-ray and electrical work with that enthusiasm and industry which characterizes the doings of the nation as a whole. A very good idea of what is going on there can be obtained from a summary of the proceedings of the American Röntgen Ray Society[6] and the American Electrotherapeutic Association.[7]

The section devoted to dermatology and electrotherapeutics at the annual meeting of the British Medical Association[8] was characterized by some features of the first importance. The opening discussion on radium and radiotherapeutics in skin disease was taken charge of by Dr. Louis Wickham, Medical Superintendent of the Radium Institute, Paris, who described his apparatus, consisting of the glass tube containing radium loose within it, and also his varnish apparatus which has been so successful in treating large areas. In these the radium grains are no longer loose, but definitely fixed by varnish, and may be mounted upon a flexible, or more or less rigid base. They can be made of any shape. He then described his method of filtration, by which the use of radium becomes more scientific and certain. Having suitable screens or filters at hand, the following methods are possible: (1) *Apparatus applied naked.* Rays numerous; special action on the surface; duration of application short. (2) *Apparatus with interposition of medium filter.* Rays less numerous; action on a greater thickness of tissue; duration of application longer. (3) *Apparatus with interposition of thick filter.* Rays very few; action on a very great depth of tissue; duration of application very long. Dr. Wickham then proceeded to illustrate cases which had been treated by him, and in which the results obtained were little less than marvellous. This paper should be closely studied, marking as it does a definite advance in the field of physical therapeutics. His method of "cross-fire," referred to later in this section, is a most important development.

The unfortunate fact remains, however, that great as one's knowledge of and skill in the use of radium may be, it is all futile unless one has a sufficiently large amount at his disposal. We anxiously await the opening of a Radium Institute in London, through which the necessary quantity may be obtained for occasional use.

Another feature of this meeting was a discussion on the supposed

risks attending X-ray treatment of ringworm. Injuries to the scalp, such as dermatitis and more or less permanent alopecia, always form a risk attending the method, but it is tending to become less as greater experience is gained. The other risk which gave rise to much discussion was that of possible injury to the brain. Considering the action of the X rays on growing cells, it is argued that X-ray applications to the head of the child may cause serious damage to the delicate brain cells. The evidence was to show that no injury to the brain had ever been done. We might point out, however, that any influence the treatment might have would be in the direction of influencing the child's mental capacity in all probability. This would take some time to determine with any degree of accuracy—a longer time most likely than has yet elapsed since the X rays were first used for ringworm. Consequently, while we do not believe that any harm is likely to occur, it is too soon to be positive on the point.

Some very important publications have come out during the past year, among which are the following :—

" Radiography in Urinary Stone," by E. Hurry Fenwick, F.R.C.S., is an admirable treatise on the interpretation of X-ray plates of the urinary system.

" Die Röntgenuntersuchung der Brustorgane," by Dr. Hans Arnsperger, is a good work on X-ray examination of thoracic disease, and is illustrated by a number of well-executed plates.

Two German works on X-ray therapeutics have appeared, one by Kienböck and one by Wetterer. Both treat the subject in a masterly manner, and are indeed bound to become classical so far as any work can in so rapidly changing a science as this.

A useful " Manual of Practical X-ray Work," by Arthur and Muir, has lately appeared, which should be appreciated by those wishing to take up this interesting branch of diagnosis.

" Electrothérapie," by Prof. T. Noyier, of Lyons, is an excellent work illustrative of the practice of the French school.

" Essentials of Medical Electricity," by E. Reginald Morton, has reached its second edition, and to it has been added a section on radiography. It is primarily designed for beginners.

Perhaps the most important work of the year is " Radiumthérapie," by Drs. Wickham and Degrais. It is a record of a vast amount of work and observation in a fascinating branch of therapeutics, and is illustrated by numerous full-sized pictures in colour. It is a classical work, complete in every way.

References.—[1]*Med. Rec.* May 22, 1909 ; [2]*Lancet*, Dec. 19, 1908 ; [3]*Münch. med. Woch.* Oct. 6, 1908 ; [4]*Lancet*, Apr. 24, 1909 ; [5]*Brit. Med. Jour.* June 19, 1909 ; [6]*Med. Rec.* Feb. 6, 1909 ; [7]*Ibid.* Dec. 12, 1908 ; [8]*Brit. Med. Jour.* Aug. 21, 1909.

ELECTRO-DIAGNOSIS.

Some interesting points were brought forward by Wertheim-Salomonson[1] during the fifth International Congress at Amsterdam. By means of the Einthoven galvanometer he was able to demonstrate

that " currents of action " were generated during voluntary contractions. These currents are of an oscillatory character, and disappear entirely when the patient is narcotized. They are demonstrated by placing one electrode under the knee and the other in the fold of the groin. On extension of knee, oscillations of a frequency of 45 per second are obtained. If a weight of 10 kilos is placed on the foot the frequency falls to 40, but their amplitude is notably increased. By exciting the patellar reflex, he has found it possible to get the current of action in single impulses. It is diphasic and lasts for $\frac{1}{100}$ second. This phenomenon has been made use of in investigating obscure cases of nervous disease.

The same writer[2] has given us another contribution on the coefficient of muscular contraction and the coefficient of polarity, in which he draws attention to the fact that there exists a constant relation between the current just sufficient to cause contraction and an intensity just causing tetanus—this is the coefficient of contraction. The relation between the least current to produce a kathodal closing contracture and an anodal closing contracture is the coefficient of polarity. Under pathological conditions these relationships are disturbed, but are restored with a return to health.

Duyvensz[3] has published a method of examination of the teeth by means of a sledge coil. The patient holds an electrode, and the other, of special form, is applied to the suspected tooth. The secondary coil is then pushed over the primary until the first feeling of pain is experienced. The position of secondary is noted, and the corresponding tooth of opposite side tested in the same way. Even slight differences of sensitiveness are detectable in this way, and of course the method is applicable to other parts of the body.

References.—[1]*Archiv. Röntgen Ray*, Jan. 1909; [2]*Ibid.*; [3]*Ibid.* May, 1909.

ELECTROTHERAPEUTICS.

An interesting discussion took place at the Sheffield British Medical Association meeting, on *interrupted currents* in medical practice. This was opened by Dr. Lewis Jones.[1] The conclusion arrived at was that rhythmically interrupted or reversed currents were very valuable and likely to come into a more extended use. For treating atony of unstriped muscle or marked degeneration in voluntary muscle, the variations must be very slow, and in the future will in all probability be much slower than are at present in use.

Pirie[2] has suggested a *new method of insulating electrolysis* needles when it is desired to avoid making scars in the skin punctures. It is of course not a new idea to insulate that part of the needle which lies in contact with the skin itself, but former methods were not satisfactory. He makes the needle red hot and rubs it over with a piece of ordinary shellac, leaving as much of the point bare as is desired. The shellac sets in an even layer, is firmly adherent, and is efficient.

Bailey[3] has contributed a useful paper on *high-frequency currents*. His idea is that the reason the organism can bear such heavy currents

lies in the fact that owing to the enormous frequency of oscillation nothing more than a vibration takes place in the tissues, without any actual transference of energy from one part to another. While he claims good results from auto-condensation, he appears to have more faith in the efficacy of the resonator discharge, applied locally, as a therapeutic agent. He has found it very useful in various forms of **Neuralgia, Myalgias,** etc.

The great feature of high-frequency applications is the fact that the body or part is subjected to the influence of electrical energy only, and without any accompaniment of electrolysis, ionic migrations, or muscular contractions which may mask the effects of electrical energy pure and simple.

We have not read so much about "*fulguration;*" but apparently it is being practised to a considerable extent. This, it will be remembered, is a glorified application of the high-frequency effleuve. Tuffier[4] thinks the method acts more by favouring cicatrization than by its power of destroying cancerous growths. Ricard[5] also has a poor opinion of the method, and considers it of no special value. According to Bergovié and Triboudeau,[6] fulguration has no special action on nerves, but care must be taken when dealing with children. Kazery[7] gives a *résumé* of the subject up to the present time, in the course of which he endeavours to establish "the sacred rights of priority and of scientific accuracy" in favour of one of his colleagues. A perusal of the literature of the whole subject inclines us to think his labours might have been expended in a different direction with greater advantage.

Fulguration has been studied by Lucas-Championnière,[8] and there is no doubt he has been impressed by the remarkable changes brought about in the treated area. According to his observations, "This method of treatment sometimes gives surprising results in cases of **Cancer,** where the conditions are such that ordinary surgical operations seem unlikely to be of much good, and where the patients wish for something to be done. The diseased tissues are replaced by reparation tissue, which leaves a very supple cicatrix. Amongst patients treated in this way the author has observed that in some who suffered from a recurrence of their disease the recurrent growth was of feeble vitality, spread with difficulty, and was easy to destroy, showing that the electrical treatment had modified the tissues in such a way as to make it difficult for cancer to grow in them. Further, in cases of inoperable cancer with far-distant infected lymph-glands, the application of the fulguration method to the primary disease was followed by an arrest of the cancerous process in the lymph-glands, from which it seems that the arrest of the cancer process extends beyond the region in which the action of the electrical application was made." Such a statement from so skilful an observer should give us cause for serious consideration.

The *Leduc current* and *electric narcosis* have not been heard of to any extent of late. At one time it was thought likely to displace the use

of chemical substances for anæsthesia. If it has not proved suitable for such a purpose in human beings, it is found to be valuable for anæsthetizing animals in the laboratory. Dr. Louise G. Robinovitch,[9] of New York, has found it extremely useful in this way. She has further made the more or less paradoxical discovery that this current can be used to first " electrocute " the animal, and then by altering the disposition of the electrodes bring the animal back to life again. She has further found the same means answer for resuscitating animals that have had cardiac and respiratory syncope induced by a chemical anæsthetic such as chloroform, and suggests that similar means should always be at hand where the administration of a chemical anæsthetic is attended with some anxiety.

REFERENCES.—[1]*Brit. Med. Jour.* Sept. 12, 1908 ; [2]*Lancet*, June 19, 1909 ; [3]*Ibid.* ; [4]*Bull. et Mém. Soc. de Chir. de Paris*, 1909, No. 18, in *Brit. Med. Jour.* July 10, 1909 ; [5]*Ibid.* No. 10 ; [6]*Arch. d'Elec. Méd.* May 25, 1909, in *Brit. Med. Jour.* July 10, 1909 ; [7]*Brit. Med. Jour.* Apr. 1909 ; [8]*Ibid.* Aug. 28, 1909 ; [9]*Lancet*, July 10, 1909.

IONIC MEDICATION.

Ionic medication has received a considerable amount of attention, and it bids fair to become an important branch of therapeutics. For those wishing for information regarding the scientific aspect of the question, a paper by Lewis Jones[1] and one by Sloan[2] will well repay careful study. The first has special reference to the treatment of superficial conditions such as diseases of the skin, and the latter to diseases of the female organs of generation; and for carrying out the methods Sloan has devised some very useful instruments, which are fully described.

Another paper, by Finzi,[3] dealing with the uses and possibilities of " Iontophoresis," as he prefers to call it, is to be recommended to those who are seeking full information. He considers the value of the chlorine ion in sclerosis as not proven, and has had good results with lithium (positive) and iodine (negative) in **Rheumatoid Arthritis.**

Fraser[4] has also found the method useful in skin diseases, notably **Rodent Ulcers** and **Septic Ulcers,** with the zinc ion, and the parasitic diseases such as **Tinea, Favus,** etc., have answered well to the use of copper. He has not had satisfactory results in lupus.

Bailey[5] also speaks highly of the use of the iodine ion in **Chronic Rheumatism** and **Rheumatoid Arthritis.** His procedure is first to apply radiant heat, and immediately after this is over to introduce the iodine and ions. In support of his methods he quotes cases which seem to have done very well.

Fletcher Little and Bokenham[6] report a case of **Bulbar Paralysis** followed by **Progressive Muscular Atrophy** treated by a new method of ionic medication. Treatment was by the ordinary methods at first, except that the Schnee bath was used, and the limbs were immersed in solutions instead of electrodes saturated with the medicament being employed. Experience has shown that the use of solutions in separate cells has not been satisfactory, and we are not surprised to find that

the results are reported as *nil*. They then began using medicated electrodes and the static current, and after fourteen applications on alternate days a decided improvement was noticed; they attribute the good result to this method, which is termed "static ionization." Unfortunately this improvement was not maintained, and the patient succumbed a couple of months afterwards. A cure would of course be too much to expect, but it would seem that they are entitled to claim some benefit from the treatment, further particulars and evidence concerning which will be awaited with interest.

Betton Massey,[7] who has been engaged for many years in the treatment of **Cancer** by the ionization of zinc and mercury, has recently written a book on conservative gynæcology as well as the paper here referred to. According to him, the fundamental facts are that by utilizing the ionic action of the positive pole "a quantity of zinc and mercury ions may be interstitially diffused throughout a malignant growth in a few minutes sufficient to kill all malignant cells and their accompanying germs."

These papers are essentially practical, and it is hoped they may stimulate more interest in a method which has not had such a trial as it appears to deserve.

A treatise on the use of ionization in a variety of conditions is given by Tayler[8] and Lewis Jones. It forms an excellent résumé of the various conditions in which ionization may be, and often is, most useful, and anyone desiring to get an idea of the scope of this form of treatment within the compass of an ordinary article cannot do better than read the one here referred to. Many cases are quoted, and the whole paper is full of valuable and practical information.

We may remind the reader that the principles and practice of ionic medication were given in this chapter of *The Medical Annual*, 1909.

References.—[1]*Brit. Med. Jour.* Oct. 17, 1908; [2]*Lancet*, July 10, 1909; [3]*Ibid.* Mar. 13, 1909; [4]*Caledonian Med. Jour.* Apr. 1909; [5]*Brit. Med. Jour.* Jan. 2, 1909; [6]*Brit. Med. Jour.* Sept. 12, 1908; [7]*Archiv. Röntgen Ray*, Mar., June, and July, 1909; [8]*Bristol Med.-Chir. Jour.* June, 1909.

RADIUM.

After a long and almost unbroken silence upon the subject of radium as a therapeutic agent, the matter received a new impetus from Sir F. Treves,[1] who gave a lecture on the subject at the London Hospital on January 26th, 1909. The seal of fashion having been set upon radium, an enormous amount of literature appeared forthwith, and as yet shows little sign of abatement. While the paper above referred to is somewhat on the lines of a popular lecture, it yet gives a very good idea of the present position of radium therapeutics, as well as many other important and interesting facts relating to this unique substance.

In the same issue of the *British Medical Journal* is an excellent leading article on the physical and chemical properties of radium. Here many most interesting facts are brought to our notice, and we are left marvelling at the extraordinary features of this element.

There is also an editorial having special reference to its therapeutic effects.

Mackenzie Davidson,[2] who is the fortunate possessor of a large supply, gives his experience and methods employed during the last six years. He has used the sealed glass tube method, which, though wasteful of energy, has at least the virtue of keeping the radium dry and active. While a method has quite recently been discovered of spreading it over a surface, subsequently drying and varnishing, this was not possible in the early days, and few if any cared to risk losing what they had in carrying out experiments of this kind. He points out that neither the hypodermic injection of the emanation nor even a solution of radium bromide itself have had any beneficial effect.

A vast amount of work has been done on radium by Drs. Wickham and Degrais, which is referred to by the Paris correspondent of the *British Medical Journal*,[3] in a series of articles. We quote from these:

One of the most striking points in the use of radium is the multiplicity of action that can be obtained by the use of one or two apparatus —for example, with a rectangular apparatus 3 cm. by 4 cm., containing 12 cgrams of radium (3 cgrams pure salt), with A. 500,000, therapeutic effects can be directed: (1) To the surface alone, causing violent irritation and destruction; (2) To the surface of the tissues alone without any irritation or destruction; (3) To a depth without irritating the surface or destruction; (4) To a depth, destroying the surface as well as the deeper parts; (5) To the surface and at a depth simultaneously with a strength about the same throughout, and without any destruction of tissue.

Therapeutic results are obtainable from each of these five modes of applications, and each has its utility. If the apparatus is employed without screens, actions 1, 2, or 5 are obtained according to the method used. If screens are interposed between the apparatus and the tissues, then intermediary actions, 3, 4, or 5, are obtained. Amongst these various methods, the most striking are those which produce results at a depth without any alteration of the tissues at the surface—for example, in actions 3 and 5.

Filtration has the advantage of allowing the passage of rays which act at a depth without any alteration of the skin surface, but it of course diminishes the sum total of rays to such an extent that long exposures are necessary. The drawback due to the feeble *quantity* of these rays which pass the filter has been overcome by Drs. Wickham and Degrais by the adoption of the method of "crossed-fire," the action of the rays resembling a bombardment by batteries at two points facing each other. Thus, if two apparatus are placed facing each other on opposite sides of a tumour, these very penetrating rays traverse the tumour in both directions and cross in the centre. The cells are thus doubly acted on, and are modified much more rapidly. If two powerful apparatus of activity 2,000 to 4,000, enveloped each in a sheath of lead 1 mm. thick, are applied, they can be fixed, without

any risk or irritation, to the skin surface, and left *in situ* during five or six nights running; but the cells at a depth are acted on by an intense force, which Drs. Wickham and Degrais found was more than double the force of each apparatus taken alone, the 'crossed-fire' having increased the intensity of the effect produced on the cells placed deeply, because during a short period the cell is attacked by the double force.

By these methods they have obtained successful results in **Cancerous Tumour of the Parotid, Cancer of the Breast, Cancer of the Uterus,** and **Carcinomatous Tumour of the Neck.** The latter was still under treatment at the time of writing, but improving rapidly.

Coming to the treatment of **Carcinoma,** Drs. Wickham and Degrais[4] report an apparent cure of cancer of the breast, which from being the size of a Tangerine orange has been reduced to "a quiescent movable nodule of fibrous consistency."

Radium was applied in this case as follows: The attempts at filtration which Drs. Wickham and Degrais had undertaken before this date with screens of different kinds (cotton-wool, aluminium, lead protected by rubber), had shown them the way to modify the therapeutic action of the radiations; these after filtration were necessarily composed of rays less in number, but of greater penetrating power. In this case a filter of lead 1·27 mm. in thickness was used with a thin sheet of rubber over it; the radium was applied in series of ten or twelve daily applications of one and a half hours' duration each time, followed by a period of rest for one or two months. Gradually, and without any irritation of the skin surface, the morbid process was first arrested, and then gave place to one of repair. In February, 1908, the ulcerated surface had cicatrized; the tumour had diminished in volume, was no longer attached at its base, and the skin had regained a certain amount of suppleness, the pain had entirely ceased, and progressively the signs of amelioration became more pronounced. These results were only obtained very slowly; but subsequently the method of "crossed fire" was applied, and having gained experience in dosing the rays, Drs. Wickham and Degrais were able to accelerate the process of repair.

Other cases are described differing immaterially from the above.

The practical conclusion is that radium treatment is capable of rendering different kinds of service in the treatment of certain cancers of the breast: (1) Radium can cause the retrogression of a cancer of the breast to such a degree as to bring about all the appearance of a cure. (2) It can transform an inoperable cancer of the breast into an operable one. (3) It can act on recurrences of small dimensions occurring after operation on cancer of the breast. (4) It can act on some affected lymphatic glands if they are not too much involved. (5) It can relieve the pain, and diminish for a time the hæmorrhage and secretions from cancerous ulcerations, and thus prolong life. (6) It can also be used after surgical operation as a preventive measure. These conclusions are not of universal application, and are limited

to cases in which the growth is sufficiently localized and of small extent; the benefits must not be exaggerated, and a great drawback in practice is the considerable quantity of radium necessary for each treatment.

Further papers on the treatment of cancer may be referred to by those who wish to read as much as is available on this subject. Gaucher,[5] Williams,[6] [7] and again Wickham[8] in his address before the Royal Society of Medicine, are all strongly in favour of the use of radium in cases of malignant disease. One of the most interesting statements is made by Wickham,[9] viz., that from the evidence at his disposal radium has a "specific" action on the following: **Cancer, Tuberous Angiomata, Keloids,** and lastly certain chronic skin affections such as **Lichenoid Eczemas.** By specific action he means that it is possible to cure the above without any actual destruction of skin. The point raised is illustrated by a record of cures which have been brought about under these conditions. In order to achieve such results a certain dose must not be exceeded; if it is, the destructive action of radium is superimposed upon its specific action. It is this successful employment of the "specific" action that is one of the great triumphs of the work of Drs. Wickham and Degrais.

The destructive action of radium, employed with a therapeutic object, is well known, for when radium was first introduced this action alone was utilized. It is interesting, therefore, to note that Dr. Wickham tries to avoid this destructive action and to limit the cases in which this destruction is necessary. It has been found that in some cases long, even one or two years, after the treatment has ceased, the new-formed tissues have become the seat of telangiectases, a drawback which must be taken into account.

The destructive power of radium may be employed in those cases in which the æsthetic result is of secondary importance and in which, even if telangiectases supervene, the condition is still superior to what existed previously—cases, in fact, in which a destructive reaction is necessary, and when, as in lupus, radium has no selective specific action. In such a case the lesion is of so grave a nature that, if destruction brings about a cure, the few telangiectasic elements which might ultimately appear would be relatively of no importance.

In such cases Dr. Wickham does not hesitate to use strong doses—apparatus, for example, giving radiations of an activity of 500,000, which he leaves applied for five or six hours at a time. In the same way he does not hesitate to act energetically on pigmented nævi which form tumours.

The degree of the destructive action must be regulated according to the depth at which it is to operate. When superficial action is desired the apparatus is applied without a filtering screen, but to obtain a deeper destructive action a screen of medium absorbent power, from a $\frac{1}{10}$ mm. of aluminium to $\frac{1}{10}$ mm. of lead, is interposed. By using the lead screen the rays of low penetrating power are cut off; those that remain act more deeply, but it is necessary to leave them

in contact for a sufficient length of time to bring about destruction not only on the surface but in all the thickness of the tissue. At Dr. Wickham's clinic at the Radium Institute, a large and fairly deep rodent ulcer was treated as follows: An apparatus, the utilizable activity of which was 500,000, was covered by a filtering screen of lead 1 mm. thick; this was left in position for twelve consecutive nights from 7 p.m. to 7 a.m. Only a sharp inflammatory reaction was produced, a thick crust formed, and the entire rodent ulcer was involved in the reaction to the very penetrating radiations. When the crust fell off at the end of three weeks, the healed surface was excellent and solid. This was a very good result, for the ulcer had previously resisted other methods of treatment; the cure also was very quick, because fifty days after the treatment was started nothing remained of the ulcer.[10]

It will be quite evident from the number of references given that Drs. Wickham and Degrais are engaged upon a great work, that is likely to have a very far-reaching effect upon the future of medical science.

The value of radium in dermatology will be fully referred to in that section, but a few references may be given here.

Booth[11] reports a cure of **Lupus Erythematosus,** but the cure took a very long time, the actual length of which is not stated.

Crocker[12] had some good results with the emanation of radium which was prepared for him in suspension in a weak jelly of gelatin. For use it is melted in its glass capsule, the latter broken, and the fluid while still warm applied to the part. It is then covered with muslin and lead foil and bandaged on. It was found successful in **Eczema** of fingers, **Granulomatous Tumours, Mycosis Fungoides,** etc. The chief difficulty would appear to be that of obtaining sufficient quantity to bring it into every-day use.

Iredell[13] and Minett record their experiments with the effect of radium on bacteria. The results obtained were negative almost entirely.

It may be pointed out that at present the favourite method of using radium is in the form of the sulphate, coated upon flat, flexible materials, and covered with a thin impervious varnish.

Bulling[14] gives his experiences in the use of water impregnated by radium emanation, as well as the water of some natural springs which are radio-active. He recommends it in **Gout** and **Bronchial Catarrh.**

Butcher[15] has given a very useful paper on the therapeutic use of radium which was read at the Amsterdam Congress. He possesses a very active specimen, and considers it important not to use it with anything more than a thin layer of talc between the radium and the patient. He has had excellent results in a variety of conditions, and his paper is worthy of close study.

Warden[16] has recorded the full details of what is probably the first case of the treatment by radium of **Lymphatic Obstruction** (cervical, submaxillary, and axillary) in a patient suffering from

filaria nocturna. Under this course the several glandular masses rapidly diminished in size. At the time of writing the patient's general health had improved, his temperature had been normal for over a month, and his appearance was that of perfect health.

At the annual meeting of the British Medical Association at Belfast Dr. Wickham[17] gave an address on the treatment of **Skin Diseases** by radium. The principles involved are essentially the same as already given. He uses naked radium for very superficial disorders, such as lichenification of the back of the neck; a medium filtration for conditions such as epithelioma, and a thick filtration where the rays are few but very penetrating, for deep-seated growths, the exposure in the last instance being very prolonged—perhaps twelve or even twenty-four hours.

Thorium.—Chesney[18] reports some cases of **Pharyngeal** and **Laryngeal Disease** successfully treated with the emanation of thorium. She uses a special form of inhaler which is charged with 3 to 4 oz. of thorium nitrate in 17 oz. of water. "The method employed is for the patient to take a long breath through the mouthpiece, then hold his breath while he counts twelve slowly, and then breathe out again. A minute should then elapse for the emanations to collect again before the next inhalation is made. As a rule, patients inhale for thirty minutes twice daily, but I have found good results from inhalations for fifteen minutes twice daily. I have now used thorium in about thirty cases of throat complaints. Many of the patients were suffering from pulmonary phthisis, and the throat condition was secondary to that of the lungs; some have been cases of ordinary chronic or acute pharyngitis and laryngitis. In a few cases of tuberculous ulceration of the larynx I used radium."

Her results are: "I never found that thorium had any effect upon the lung condition in cases of phthisis. Many patients improved greatly so far as their chests were concerned, but, as they were under strict sanatorium treatment, it is probable that the pulmonary disease would have improved any way, and that the thorium had nothing to do with the amelioration. In most of the tuberculous cases thorium was only used when the local throat condition did not seem to be benefiting under the ordinary open-air treatment, and, therefore, when decided improvement in the throat was noticed after inhalations had been begun, the thorium may safely be given the credit. In some cases, though the lung condition got steadily worse, the throat either remained as it was or got better appreciably. In other cases thorium has not appeared to do any good, but as a rule in these cases the chest also did not improve and the patients got rapidly worse."

REFERENCES.—[1]*Brit. Med. Jour.* Feb. 6, 1909; [2]*Ibid.* Mar. 6, 1909; [3]*Ibid.* Mar. 6, Mar. 27, and Apr. 10, 1909; [4]*Ibid.* May 22, 1909; [5]*Ibid.* Jan. 23, 1909; [6]*Ther. Gaz.* May 15, 1909; [7]*Jour. Amer. Med. Assoc.* Sept. 12, 1908; [8]*Lancet*, May 29, 1909; [9]*Brit. Med. Jour.* May 29, 1909; [10]*Ibid.* May 8, 1909; [11]*Ibid.* Apr. 31, 1909; [12]*Lancet*, May 22, 1909; [13]*Ibid.*; [14]*Berl. klin. Woch.* Jan. 18, 1909; [15]*Archiv. Röntgen Ray*, Jan. 1909; [16]*Lancet*, July 24, 1909; [17]*Ibid.* Aug. 7, 1909; [18]*Pract.* Aug. 1909.

RADIOGRAPHY.

Knox[1] has published a useful paper on the diagnosis of **Diseases of the Skull,** which it is hoped will draw some attention to a method which has so far been neglected. He shows how it is possible to diagnose intracranial tumours, and gives a simple method of localizing foreign bodies in the cranial cavity.

Willett-Cunnington[2] has drawn attention to the " tree-branch " striations occasionally seen in skiagrams of **Tuberculous Lungs.** In his opinion they are only found in tuberculous subjects, and indicate that they are " part of a recuperative beneficial change going on in the lungs."

This is of course no place for controversy, but as we have not seen any other papers dealing with this aspect of the question, we may perhaps be permitted to give our own opinion, which is based upon a fairly large experience. Tree-branch markings can be demonstrated in healthy subjects as well as those afflicted with disease. They are more likely to be seen in plates properly, or slightly under, exposed They are almost always lost if a full or over exposure has been given. The above at least is our experience, and we should be glad if others would join in investigating the matter.

Krause[3] has contributed an important paper on the X-ray examination of cases of **Pulmonary Disease.** He considers it essential to have the tube enclosed—not only to cut off the stray X rays, but also the visible light—and provided with an efficient diaphragm and free movement in every direction. Further, the room must be absolutely dark. All these conditions being satisfied, he claims to be able to make an accurate diagnosis before any other method can do so, even with the fluoroscope, but in doubtful cases a radiograph clears up the matter. This applies more particularly to early tuberculosis of children.

A further paper of the first importance was read by Lester Leonard[4] at the 1908 meeting of the British Medical Association. By means of practically instantaneous radiographs, he has been able to demonstrate enlarged or **Infiltrated Bronchial Glands** in or near the mediastinal space. This was done before any clinical signs could be made out, and subsequent events proved the correctness of the diagnosis.

Lange[5] has raised an important point in the X-ray examination of cases of **Œsophageal Stricture.** He found, as no doubt have many others, that the use of bismuth emulsions and jellies is not entirely satisfactory unless the obstruction be more or less complete. If the passage be but partially obstructed, the emulsion readily adapts itself, and passes through with scarcely any delay. To obviate this he advises the bismuth being placed in a rice-powder cachet, which tends to keep its shape, and this, if of a size just suited to the normal œsophagus, would be delayed for some time at any point where there was even a very partial occlusion. We think that these cachets or flexible gelatin capsules of suitable size and shape and containing

from ¼ to ½ oz. of bismuth will be found very valuable for this class of X-ray investigation. Lange[6] has also given us a very full and complete paper upon the whole question of œsophageal examination, and illustrates his remarks by photographs and skiagrams.

Lester Leonard,[7] by the use of the Snook Röntgen apparatus, has shown us the great advantage of short exposures of one second or less in the study of gastric and intestinal motions. Peristaltic waves are clearly shown in the stomach immediately after the ingestion of the bismuth meal, and in a plate made six hours after, similar waves are seen in the large intestine. He also points out a curious fact—and one not generally known—that the stomach elongates in its perpendicular axis during expiration, and contracts during inspiration, the base or lower third remaining immovable at the same level as the pylorus.

Pfahler[8] considers the Röntgen method a very valuable one in the diagnosis of **Gastric Carcinoma,** but that great caution is necessary in forming an opinion. He considers plate and screen both necessary, and in the former looks for an abnormal course taken by the bismuth —necessitating a knowledge of the normal progress—as well as alterations in the size, shape, and position of the meal after it has arrived at its first temporary halting-place. The standing position with the screen against the abdomen is the best. He thinks each case should be thoroughly studied clinically before the X-ray examination is begun; this saves much time and uncertainty.

The whole matter of the X-ray examination of the digestive tract was fully discussed by Thurstan Holland,[8] Barclay, Hertz, and others at the meeting of the British Medical Association at Sheffield in 1908. This should be referred to, as well as another paper by Barclay,[9] which was read at a meeting of the Electro-therapeutical section of the Royal Society of Medicine.

Kaestle[10] recommends the oxide of thorium, in place of bismuth as an indicator, on account of the intense shadows it gives even in small doses. It is quite inert, pure white, and without taste or smell. Its high cost will, however, prevent it coming into very extended use.

In radiography of the **Urinary System,** the chief advances have been made in the direction of improving existing methods and the more accurate interpretation of the radiographs obtained. The present position of this branch of radiography is summed up in a paper by Bruce.[11] He believes it possible to get good radiographs of almost any subject—no matter how obese—but that at times it is necessary to make frequent examinations and free use of evacuants to thoroughly cleanse the intestines. Certainly in our experience it is far too frequently the case that patients are sent for X-ray examination of this or other of the more difficult parts, in the expectation that a set of the best possible radiographs will be forthcoming after the first attempt. This is unreasonable in view of the conditions appertaining to radiography at present. In many cases, at least, too little time is given to the radiographer to make a thorough and complete examination—this is especially the case in hospital practice.

The technique of Boggs[12] differs somewhat from the usual practice. For the first exposure he uses two 14 × 17 plates one on top of the other; this takes in kidneys, ureters, and bladder. The reason for the two plates is to exclude possible errors through imperfections in the emulsion. After these are developed and studied, if there are any suspicious shadows other plates are made with a compression diaphragm. In making the first exposure, the tube is directly opposite the umbilicus and twenty-two inches from the plate. In this way the rays passing through the pelvis will show the shadow of a lower ureteric or vesical calculus clear of the sacrum, in the shadow of which a small calculus might be lost.

As showing the great advance made in renal radiography, Fenwick[13] has contributed a very excellent paper. From a radiograph he was able to make a positive diagnosis of **Tuberculosis of the Kidney,** and act in every confidence of the correctness of his findings.

Meijers[14] draws attention to an important application of the Röntgen Rays in legal medicine. It appears that in the new-born the first act of respiration is accompanied by an act of deglutition, so that air finds its way into the stomach at the same time as into the lungs. Radiography shows nothing of the thoracic and abdominal organs in the case of those who have not breathed. If they have breathed for a few minutes only, the thoracic organs are not visible but the abdominal are much more clearly delineated. We should naturally expect the thoracic organs to be the first to become inflated, but this does not appear to be the case. The paper goes on to study the changes in infants' bodies in various stages of decomposition, indicating that this first takes place in the intestines, having been filled with air which had been swallowed—again demonstrating that it is the abdomen that shows whether the body be that of a still-born child or not.

Thurstan Holland[15] has shown how short exposures may be obtained in kidney work with a mercury break. He uses a Béclère break and intensified coil worked direct from the 230-volt continuous current main; the patient is recumbent, and a diaphragm compressor is applied with as much pressure as can be borne. He gives two radiographs which are very clear and good, the exposure being five and fifteen seconds respectively.

Eykman[16] has made experiments in Röntgen-cinematography, especially in observing the movements of deglutition. The apparatus is necessarily very complicated and not very practical, but it is important as a beginning of what may come to be an important means of scientific investigation.

Proust and Infroil[17] have recorded the details of a case which gave every possible sign, by the X rays and otherwise, of the presence of a calculus in the lower end of the ureter. The patient was operated upon, but eventually died. After much trouble and repeated post-mortem radiographs, the body giving the shadow which was thought to be a ureteral calculus was found to be two phleboliths in a peri-ureteral vein.

" It is pleasing to find men of recognized talent, putting themselves to so much trouble to point out how even they may be misled by new methods supposed to ensure precision in clinical research and diagnosis."

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X-RAY TREATMENT.

The use of X rays in **Hypertrichosis** would appear to be coming back into favour, though the deplorable results which followed their first use in this condition will probably take some time to live down.

Noiré[1] has taken up the matter in a new way, and shown how treatment may be carried out with comparative safety. He makes use of a plate of aluminium in the path of the X rays, and of a thickness calculated to stop all those short rays capable of producing an effect on the skin without penetrating as far as the hair papilla. The proper thickness he finds to be 0·4 mm. Repeated applications are necessary, and the process takes eight or ten months in the case of a complete beard.

We place, he says, the skin of the patient at a distance of 15 cms. from the antikathode, and we interpose our aluminium plate in the path of the X rays, 4 cms. from the skin, in order to avoid the injurious action of the secondary rays. The pastille of platinocyanure of barium of the X-ray radiometer is placed $7\frac{1}{2}$ cms. from the antikathode on the one hand and from the skin on the other, and in the actual path of the pencil of rays which is employed. If the skin were placed at more than 15 cms. one would be obliged to expose too long, and if it were placed nearer there would be too much difference in the distance from the antikathode to the centre of the surface undergoing treatment and that to the periphery. The exposures must be separated by intervals of fifteen days ; we take it as an absolute rule to leave the patient alone for this length of time ; that is the result of our experience. On each occasion the time necessary to obtain the tint *B* of our radiometer is given to the exposure. But behind the aluminium plate the skin will not have received the four and a half units *H* which it would have received without it.

A fortnight afterwards the patient returns, with hairs which have not fallen out, but which have all the characters of peladic hair—that is to say, clubbed, thin, and depigmented at the base. A fresh application is made, and eight to ten days afterwards a certain number of hairs begin to fall out. According to the case, four or five applications are afterwards made at intervals of a fortnight, and by this time all the hairs will have fallen out. We should still make two more exposures, which experience has shown to be useful, but at intervals

of a month. The skin must afterwards be left to recover. Commonly there is produced after two months a slight regrowth, representing about one-tenth of the fallen hairs. Two or three new applications will cause them to disappear, and this time finally.

In this connection a paper by Donald[2] may be referred to. His technique is quite different—the dose is measured by the number of interruptions, and no screen is used. The dangers to be avoided are fully discussed. The same writer[3] has had good results in the treatment of **Port Wine Stain** by X rays.

The papers on the X-ray treatment of **Malignant Disease** have not been numerous: the most prolific writer on this subject seems to have been Pfahler,[4] of Philadelphia, who considers that 25 per cent of cases should recover, or if treated early, 50 per cent. It is doubtful, however, if such favourable results will be borne out in practice. His methods, which do not differ very materially from those in general use, are given elsewhere[5] [6], with detailed cases in the latter paper. His conclusions are: (1) Cases that are operable should be operated upon, and this should be followed by early and thorough post-operative Röntgen-ray treatment. (2) Sarcomas yield better to the X rays than carcinomas. In sarcoma it seems from the foregoing results that we may hope for 50 per cent of recoveries. In the series reported, 65 per cent have recovered. (3) Localized recurrent carcinoma will usually yield to the Röntgen rays, unless the mucous membrane be involved. (4) Occasionally good results are obtained even in advanced cases of carcinoma, but generally one can hope only for palliation or prolongation of life. (5) Good results will depend very much upon good technique.

Mader[7] reports a case of malignant ulceration low down on the pharyngeal wall. Treatment was carried out by a special tube, and on each occasion the exposure was from sixty to eighty minutes, made up of ten-minute applications with a rest between. Nine sittings were given in all, and the result was apparently completely successful. The special tube seems to be one in which the rays can escape only by a window placed in contact with the growth, at the end of a prolongation which is passed in through the mouth—no doubt a modification of the Cossor therapeutic tube.

A new method of applying X rays in internal disease has been suggested and tried by Beck.[8] In a case of **Carcinoma** of the pylorus the mass was freed from its surroundings, brought out of the abdominal wound, and secured. Soon after X rays were applied daily for nine days. An erythematous spot showing on the pylorus, the X rays were stopped, and a few days afterwards it was pushed back into the abdomen. The X rays were afterwards applied once a week for fifteen months, during which period there was a gain in weight of 18 lb. Other cases are quoted, and the method appears to be one that ought to receive further attention.

The case for the X-ray treatment of **Malignant Disease** is very fairly stated in a paper by Iredell,[9] and after describing some cases more

or less in detail, he concludes: (1) In superficial forms of malignant disease X rays may temporarily arrest the course of the disease, relieve the pain, diminish the discharge, and heal up the ulcers. (2) Probably X rays prevent the occurrence of superficial secondary deposits. (3) Embryonic cells are more easily destroyed by X rays than are normal cells. This we may say very accurately summarizes our own experience in the treatment of a very large number of cases in the Electrical Department of the London Hospital, and as our experience now extends over six years, we are inclined to question the accuracy of observation of those who claim results markedly superior to those put forward by Iredell.

Jangeas[10] reports a case of **Tumour of the Trachea** cured by X rays. No microscopic evidence seems to have been forthcoming, so that the report loses some of its value.

The X-ray treatment of **Ringworm** continues to become more and more popular, but concurrently with this extensive employment there has arisen in the minds of many some doubts as to the method being entirely free from risk. Considering the action of the X rays on young cells, it has occurred to them that the delicate and growing brain cells of the child might suffer more or less injury in the course of an epilation for ringworm. The matter will be found very fully discussed in a leading article and contributions by Adamson[11] and MacLeod, and while there is no evidence so far of any damage being done or likely to be done, yet it is permissible to think that perhaps too little time has elapsed to be quite sure of this. If damage were done it would in all probability be only a slight impairment of mental power, and this of course would be a most difficult subject to investigate with any accuracy, especially as it would be some years before the change could be noticed, and by that time the fact of X rays having been applied to the individual in question may have been forgotten.

While we naturally would be the last to try and limit the use of X radiations in therapeutics, yet it is not an unmixed evil that the profession and the public are becoming more critical. For the first few years after the X rays were employed in therapeutics, the impression one gained from a perusal of all the papers written on the subject was that it was a certain and infallible cure, or nearly so, for every disease hitherto considered practically incurable. This may be termed the "positive phase" of X-ray therapeutics. By all appearances this phase has passed, and we are at least entering upon a phase possessing a distinctly negative character. This state of affairs is no bad sign; it merely means that we are now quickly approaching a more accurate knowledge of its real value.

In addition to the dangers above referred to, we may with advantage peruse a paper by Gottheil[12] in which he speaks with refreshing frankness of the dangers and abuses of the X ray as a therapeutic agent. We use the word *refreshing* advisedly. Reading many of the reported cures by X rays, from contributors in foreign parts especially, and recalling one's own experience in almost identical cases, a feeling of

regret was always induced, in that we seldom if ever could get such good results, notwithstanding that our technique differed in no essential particular. It is here that the paper above referred to makes comforting (and yet disappointing) reading. Gottheil's conclusions may be stated here, but this is not to say that we endorse them *in toto*: "(1) The X ray is a remedy of positive, though strictly limited, value in dermatology. (2) It is to be used with caution, since its dosage is unmeasurable, the individual reaction to it is unknowable, and its results uncertain in any given case. (3) It should be employed only in the more serious dermatoses in any case, and in these only when it is entirely certain that safer and simpler means of cure are ineffective. (4) It is not suitable for use by the general practitioner in dermatotherapeusis, but should be employed in this field only by those whose familiarity with the method and with dermatology as a whole is a guarantee of certainty of diagnosis and the observance of all the cares and precautions prescribed by experience. (5) The X ray should not be used in the treatment of eczema, psoriasis, acne, alopecia areata, alopecia prematura, hypertrichosis, folliculitis, verruca, ordinary ringworm, favus, etc., all of these being maladies for which we possess other efficacious therapeutic measures. In lupus erythematosus it is conceded to be useless. Epithelioma and rodent ulcer, except when so far advanced or so situated as to be unsuited for caustics, the curette, or the knife, are also to be excluded from the list. (6) The X ray may be used in lupus vulgaris, though it is not the only method of cure in many cases; in scrofuloderma, on account of the tediousness and uncertain results of other medication; in very extensive cases of ringworm of the head and beard for the same reasons. (7) The X ray is the treatment of election in epithelioma and rodent ulcer so situated that other methods of treatment cannot be employed, or so extensive that other methods are hopeless, and in relapses after other methods; in tuberculosis cutis, erythema induratum, and some other tuberculides; in sarcoma, mycosis fungoides, rhinoscleroma, keloid, and acne keloid, in all which diseases no other method known to me has given as good results."

Among Continental writers, we may refer to papers by Blaschko[13] and Rudygier,[14] jun., on dermatological subjects. The former advocates for this class of work the use of soft tubes and small doses, as he considers these more active than large ones. He is distinctly sanguine and even enthusiastic on the value of the X ray in dermatology. The latter's paper is devoted to the treatment of **Rhinoscleroma,** which he considers curable by X rays if the latter are properly used; he advocates large doses, and treatment carried on for a long time.

Geyser,[15] by means of a special form of tube not unlike the Cossor tube, in that it is made of lead glass with a flint glass window, claims to be able to apply X rays without any risk of producing X-ray dermatitis. The window of his tube is *flat*, and placed in contact with the skin. In this way he avoids ionization and the induction of

PLATE XX

X RAYS IN POLYPOID FIBROMA

Before treatment, March 10, 1909

Photo. by Dr. W. Kenneth Wills

PLATE XXI

X RAYS IN POLYPOID FIBROMA

After treatment with eleven applications, June 11, 1909

Photo. by Dr. W. Kenneth Wilis

currents in the skin by the tube itself. This he considers the cause of so-called X-ray dermatitis, and the latter term a misnomer. After a conversation with Dr. Geyser, we are convinced of the strong probability of the truth of what he says, and preparations are being made with a view to doing some work here on the same lines.

Albers-Schönberg[16] reports some very successful results in the treatment of **Uterine Myoma,** and hæmorrhages due to it and the climacteric. Under the irradiation the purulent slimy discharge entirely disappeared, and there was relief from the usual symptoms as well as a great improvement in the general health. The treatment is through the abdominal wall, but the utmost care must be taken to prevent any skin reaction. In an average case, fourteen applications are sufficient to bring about a practical cure.

Further evidence of the value of the X rays on non-malignant tumours is afforded by the case illustrated herewith—the details and photographs of which have been supplied by Dr. Kenneth Wills. *Plates XX* and *XXI* show the effect of X-ray treatment on a **Polypoid Fibroma,** originating from a left inguinal hernial scar. Dimensions: 1¼ in. long, ¾ in. broad, ¾ in. deep. The case is that of a boy aged 15. X rays were applied solely with the intention of ascertaining what effect they would have upon a growing fibroma. The result of eleven applications, extending from March 10th to June 2nd, is shown in the second photograph, which, however, was taken in a very indifferent light. The present condition (October, 1909), without further treatment, is that there is only a broadened scar remaining, and no elevation of any kind.

Buschke[17] has found the X rays of decided use in the treatment of **Syphilitic Ulceration,** notwithstanding that other observers had denied the possibility of this being the case. He gives details of several cases which bear out his contention, but he agrees with others that the X rays applied to the primary sore have little or no effect.

Paul Gaston[18] considers that the X rays seldom cure **Acne** without reaction, and that on this account the method is not to be used for acne of the face except under the most extreme circumstances. His experience is on the whole favourable, and especially is it applicable to those cases which have resisted other means of treatment.

Acne keloid of the back of the neck is much more resistant, and it may be necessary to produce a fair amount of reaction before any improvement is possible.

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Part II.—The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS

FOR 1909. BY MANY CONTRIBUTORS.

Togther with a brief Synopsis of Treatment recommended during recent years.

GENERAL REVIEW.

ACUTE INFECTIOUS DISEASES.—The channels through which a "carrier" case of typhoid fever may infect a number of other persons have been still more clearly demonstrated by several outbreaks, of which brief abstracts will be found in the article on typhoid fever. Hopeful attempts to treat this disease by specific sera or vaccines have been made by several observers during the past year or two. These constitute the most recent innovations (if such they can be termed) in the treatment of acute infectious diseases.—[E. W. G.]

* * * * *

CIRCULATORY SYSTEM.—The subjects which have received most discussion during the past year are the accuracy or otherwise of our methods of estimating the arterial pressure; the treatment of high arterial pressure; the investigation and diagnosis of cardiac disease by the use of graphic methods; and the relative value of the various cardiotonic preparations, the intravenous injection of strophanthin especially. Some useful work has been done in assessing the real importance of syphilis as a cause of aortic disease, and notice has also been paid to the causation and treatment of angina.—[C. F. C.]

* * * * *

DISEASES OF CHILDREN.—The attention which has been given in recent years to infant feeding has had, as one of its not least important results, an ever-increasing outcry against the unclean and dangerous slovenliness of the milk supply, in this and other countries. The bulletin issued recently by the Government Laboratory at Washington contains much important information upon the practical aspects of dairy-farming and the methods of reforming the milk supply. The three grades of milk which are now recognized in America, "certified," "inspected," and "ordinary" milk, are at least a step in the right direction. The certified milk which conforms to certain high standards fixed by a body of medical men, the so-called "Milk Commisioners,"

is sold with some stamp or label upon the bottle, showing that it is produced under the special conditions imposed by the Commission, and naturally it is sold at a higher price than the ordinary carelessly produced milk. The conditions enforced before milk may be sold as "inspected" are less stringent, but the bacterial count allowed is only 100,000 bacteria per cubic centimetre, and even this is a much lower number than would be found in most samples of London milk.

Another matter of practical importance which has been investigated by Government officials is the use of preservatives in cream. Dr. Hamill's investigations on this subject are well worthy of study by all who have to direct infant feeding. His observations show that the use of certain preservatives is very general, and he mentions symptoms which are thought to have been traceable to this cause.

In the study of infantile diarrhœa, much research is still being devoted to etiology; Morgan and Ledingham's studies of the bacteria connected with this affection are particularly interesting, in relation to the part played by the common house-fly in conveying the diarrhœal infection.

A new departure in the treatment of enuresis is the use of thyroid. Its value must be considered as still *sub judice*.

In the diagnosis of congenital syphilis, the use of the Wassermann blood reaction has been found to be of value by some observers, but it is admitted that a negative result does not prove the absence of syphilis.—[G. F. S.]

* * * * *

Dermatology.—No very striking innovation in therapeutics is to be recorded during the past year; the further possibilities of treating disease by radium have been much advocated and investigated, and the use of ionization, liquid air, and carbonic dioxide has been extended and improved.

The second International Conference on Leprosy which took place at Bergen in August, 1909, resulted in some important conclusions. The vexed question as to whether lepers should be isolated or not has again been decided in the sense that segregation is to be recommended. The conference passed a resolution that no specific remedy had yet been discovered for the disease, and urged the continuance of researches for such a remedy. The utilization of the Wassermann reaction for detecting the presence of leprosy is an important advance in diagnosis.

British dermatology has suffered a grievous loss in the death of Dr. Radcliffe Crocker, for so long the leading exponent of this branch of medicine in England, and of Sir Stephen Mackenzie; while in France the death of Ernest Besnier has removed the *doyen* of the French school.—[E. G. L.]

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Nervous Diseases.—Perhaps the most striking advance in the therapeutics of nervous disease within the past year has been in the

surgical treatment of certain chronic nervous affections. Thus, for example, chronic spastic paralysis has been benefited by operation, not on the motor nerves but on the sensory or posterior spinal nerve-roots. Similar principles have also been applied successfully in the treatment of the gastric crises of tabes, where encouraging results have been obtained. The principles of treatment of tics and habit-spasms are indicated, and attention is also directed to the treatment of such maladies as tetanus, coccygodynia, sciatica, tic douloureux, sea-sickness, and other maladies of importance. Additional facts have also been pointed out with regard to the symptomatology of caisson disease and the diagnosis between functional and organic hemiplegia.—[P. S.]

* * * * *

Pulmonary Diseases.—The principal points to receive attention in 1909 have been the specific methods of diagnosis and treatment of tuberculosis described in last year's *Annual*. Reference is made in this volume to the use of tuberculin and Marmorek's serum and the J. K. treatment of Spengler, and to Calmette's ophthalmic test. The relation of the opsonic index to the temperature in tuberculosis has also been investigated.

The use of vaccine treatment in pneumonia has received further trial, and is described.

Under pleurisy the value of Grocco's triangle as a sign of effusion, and the injection of gas or sterilized air to facilitate evacuation of the fluid, is discussed.

The increasing application of surgery to the treatment of disease of the lung is dealt with under the heading "Thoracic Surgery."—[J. J. P.]

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Cancer.—The etiology of cancer remains enshrouded in darkness, and upon this subject the record is rather one of fluctuating opinion than of progress. Upon the whole, the parasitic theories have lost ground, but it would be easy to find well-known names to support them. Borrel and Ford Robertson have adduced new observations in their favour, but the majority of pathologists now adhere to the endogenous or biological theory of cancer, which regards the disease as parasitic only in the sense that the cancer-cell is itself a parasite upon the economy. Lazarus-Barlow has attacked the problem of causation upon the working hypothesis that radio-activity is the essential causal factor. His results are interesting, but at present inconclusive. Bonney has shown that certain changes in the connective tissues—changes which may be presumed to facilitate infiltration—are invariable precursors of carcinoma.

In regard to pathology, the detection of cholesterin crystals in the cells of new growths (Powell White), and the discovery in cutaneous cancer of inflammatory changes in the corresponding posterior-root ganglion (Lenthal Cheatle), are new observations. Stress has been

increasingly laid upon the significance and constancy of natural processes of repair in cancer. The temporary success of a host of cancer remedies is thus explained.

The writer has to record with some satisfaction the confirmation and general acceptance of the permeation theory of dissemination, both in this country and in America.

In regard to mouse-cancer, partial success has attended Bashford, Murray, and Cramer, of the Imperial Cancer Research Fund, in their efforts to secure artificial immunity. Ehrlich and others abroad have also studied this question.

The diagnosis of cancer has made no marked progress. Brieger's reaction, dependent on an increase in the antitryptic power of the blood-serum, has proved not to be specific to cancer. It has been shown by F. W. M. Palmer and others that a marked decrease in the hydrochloric acid of the gastric juice occurs in many forms of cancer, and not alone in stomach cancer. Moreover, the missing acid does not return after removal of the growth. A. Leitch (Dundee) has described a new and rapid method for histological examination during operations.

Elsie M. Royle has shown that there is a marked diminution in the excretion of phosphates by the kidneys in malignant disease.

In treatment, a succession of cancer remedies, on their way to oblivion, have passed in turn through the hands of the enthusiast, the experimental therapeutist, and the quack. Trypsin has gone, and fulguration bids fair to follow it. X rays have secured an established but limited position. The remedy of the moment is radium, but there seems but little hope that it will prove itself superior to X rays. For the more chronic cases of inoperable cancer, systematic open-air treatment seems to be worth a trial. Surgical removal, wherever possible, remains, speaking broadly, the only reliable resource.—[W. S. H.]

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Tropical Medicine.—A new human trypanosome, *T. cruzi*, has been found in Brazil; but so far it is uncertain whether it is of much pathogenic importance. The conflict of opinion that has prevailed for many years as to the mode by which tsetse flies convey trypanosomes, viz., whether mechanically or after a developmental cycle comparable to that of malaria, is apparently nearing solution. Kleine has made the important observation that tsetse flies, after biting an infected animal, are infective, for a short period immediately following the act, that they soon cease to be so, but again acquire this power. These observations, confirmed already by Bruce, seem to point to a developmental cycle in the fly. Baldrey, too, has shown that the rat-louse after sucking the blood of a rat infected with *T. lewisi* becomes infective only after a period of about eight days.

With regard to the treatment of trypanosomiasis there has been no material advance, and in the opinion of some, the treatment with

small doses of arsenic is as effective as atoxyl or other much-vaunted drugs. In the treatment of animal piroplasmosis it has been claimed that afridol blue is a cure for the disease in dogs, but it would already appear as if this statement was hasty, and that we have simply a drug analogous in its action to atoxyl and other trypanocides in that it banishes the parasites for a time, but later these return. In the case of tropical diseases which are frequently due to protozoa, it would appear that prevention is better than cure. Notably is this the case with malaria and yellow fever, and in both these we have many examples of successful prophylaxis on a large scale.

The discovery of a spirochæte in the kidneys only, of a case of yellow fever, has not settled the etiology of the disease, for although the spirochætes were undoubtedly there, yet they have not been found in any other cases.

In Jamaica the tick plague, as far as it concerns cattle, seems likely to be successfully coped with, as Newstead, of the Liverpool School of Tropical Medicine, has devised a most efficacious wash consisting of soap, paraffin, naphthalin, and arsenic. [J. W. W. S.]

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Syphilis and Gonorrhœa.—The *Treponema pallidum* (more commonly known as the *Spirochæta pallida*) holds its own as the micro-organism of syphilis, in spite of the attempts of Van Niessen to uphold his alleged bacillus—which no other observers appear to have seen—as the microbe of syphilis.

Much work has been done on serum diagnosis, and several modifications have been introduced with the object of simplifying the original technique of Wassermann, Neisser, and Bruck; but, as none of these can be performed outside a well-equipped laboratory, they are of limited practical value. The question whether a positive serum reaction signifies the presence of living spirochætes in the body is not definitely settled, most observers confining themselves to the statement that a positive reaction signifies that the "virus" is still active. This is an interesting point, for if a positive reaction means that living spirochætes are still present, it follows that tabes and general paralysis (which give a positive reaction in most cases), hitherto designated as "parasyphilitic" affections, are really manifestations of active syphilis. In this case the term quaternary syphilis would be more correct than parasyphilis.

As regards the treatment of syphilis, the new arsenical preparations atoxyl (or soamin) and arsacetin (or orsudan) have been extensively tried; but, although there are differences of opinion as to the value and indications of arsenical treatment, all authorities agree that it should not replace mercury. Of the various methods of administering mercury, grey-oil injections appear to be gaining in favour in spite of many fatal accidents which have followed their use, most of these being probably due to errors in dosage and to administration in unsuitable cases.

The vaccine treatment of gonorrhœa has been tried with apparent success in acute cases, as well as in cases of chronic gonorrhœa and its complications.—[C. F. M.]

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Throat, Nose, and Ear.—The practicability and the value of direct examination of the larynx and lower respiratory tract have steadily gained ground during the past year, and records of work accomplished are to be found in all journals devoted to diseases of the throat. Several new and ingenious instruments to cope with cases of special difficulty have been designed by Brüning of Freiburg.

The employment of radium in the treatment of malignant disease of the œsophagus has been extensively tried by Guisez in France and by Hill in this country, the radium tube being passed down the gullet through the œsophagoscope and allowed to remain *in situ* for varying periods.

In the treatment of laryngeal tuberculosis, considerable attention has been given to the employment of galvano-caustic puncture, and in suitably selected cases some valuable results have been obtained.

The treatment of various forms of pharyngeal and laryngeal ulceration by specially prepared vaccines has also been extensively tried, with fairly gratifying results.

In cases of laryngeal stenosis, the operation of laryngostomy has been extensively practised abroad. In this country it has not met with such favour.

Very considerable attention has recently been bestowed upon the various methods in use for the removal of pathological tonsils, and the value of complete enucleation (tonsillectomy), as opposed to partial excision (tonsillotomy), has gained ground, the enlarged tonsil being regarded as an enlarged gland demanding treatment upon general surgical principles.

In aural surgery the main advance during the past year has been in the diagnosis and treatment of labyrinthine disease, special credit being due to Drs. Bárány and Neumann, of Vienna, and Dr. A. Gray, of Glasgow, for their epoch-making researches.

The relative value of the caloric and rotation tests is still *sub judice*, as also is the clinical value and exact interpretation of labyrinthine nystagmus. An important forward step was made at the 8th Otological Congress at Budapesth by the acceptance of a uniform acoumetric formula.

In nasal surgery, comparatively little new work has been done during the past year. A growing tendency is, however, to be seen towards conservative surgery of accessory sinus suppuration and in the advocacy of intranasal methods of operation.—[W. M.].

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Ophthalmology.—Improvements in the methods of operating for cataract and glaucoma are still being sought for. For cataract,

the desideratum is some way of dealing with the soft matter in cases where it is desirable to operate (and these form the majority) before the cataract is mature. The usual method of applying pressure from without is in many cases ineffectual, and more or less soft matter is often left behind which may excite iritis, or if not that, may lead to the subsequent formation of a secondary cataract. The two alternative methods are intracapsular irrigation, and extraction in the capsule entire. The former appears to be growing in favour, as it is undoubtedly successful in achieving its object. The risk that has to be borne in mind in connection with it is the increased liability to intraocular infection. The latter method when successful gives an ideal result, but it appears to need a special technique which is by no means easy, and all who have adopted it admit that, at any rate in unpractised hands, the danger of vitreous loss is very much increased.

With regard to glaucoma, the difficulty arises chiefly in chronic cases where the effect of iridectomy in bringing down the tension is only temporary. Operations have therefore been devised for ensuring a permeable cicatrix by excising a wedge of sclera. Another device, described in the article on glaucoma in this volume, is to provide a new channel of exit for the intraocular fluid by establishing an opening between the anterior chamber and the suprachoroidal space.—[A. H. T.]

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Obstetrics and Gynæcology.—The last year has seen the publication of some papers of the highest importance. The subject of endometritis was fully discussed at the general meeting of the British Medical Association. Several admirable monographs on the subject of uterine myomata have appeared, dealing with the general risks of these tumours and with their effects on pregnancy, labour, and the puerperium.

Exhaustive papers on the treatment of carcinoma of the cervix by the modern radical method of Wertheim have done much to establish this operation on a firm basis in England, whilst the appeal sent out by the British Medical Association to practitioners and midwives in reference to the early diagnosis of this disease is a most important step forwards. The subject of uterine displacements has been dealt with in useful articles; a striking paper pleading for a less rigid puerperium is one of the outstanding features of the year's literature; whilst the cause and treatment of puerperal sepsis have received much attention.

The treatment of labour in contracted pelves has been exhaustively considered in several papers, and the merits of pubiotomy in particular have been set forth.

The subject of rupture of the uterus during childbirth has formed the basis of a very notable paper, and as a result, the views currently held as to its proper treatment have undergone modification.—[V. B.]

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General Surgery.—In this section there is little new to record either in theoretical or practical surgery. Several articles have been published on cancer of the breast, including one or two personal methods of operating, but the final conclusions are that a limit has nearly been reached as regards operative technique unless the supra-clavicular glands are removed as a routine measure, and further progress lies in earlier diagnosis and the discovery of some method of treating metastases. The fatal results in this disease are due to visceral and osseous metastases.

Mr. Butlin has some very good articles on cancer of the tongue, and he draws attention to the danger of treating epitheliomata of the tongue with radium; this may remove the primary growth, but what about the affected lymphatic glands? This warning should be noted by all those who are treating cancer by means of radium, X rays, and local injections. As Butlin says, the most insignificant epithelioma of the tongue is capable of affecting the lymphatic glands, and this also applies to cancers of other organs.

The treatment of tuberculosis by means of tuberculin is being tried by various surgeons in conjunction with local treatment and Bier's congestive treatment, and Ritchie draws attention to an important point in showing that human tuberculosis may be due to the bovine, the human, or rarely the avian type of tubercle bacillus, and that each of these requires its appropriate tuberculin.

Warren has collected some remote results of injuries to joints, and there is a good article by Richardson on the occurrence of so-called tetanus after the use of catgut.

Several articles have appeared on the surgery of the thyroid gland, and it is interesting to note that while some surgeons advocate general anæsthesia, others are just as emphatic in recommending local anæsthesia in removal of the gland; and this difference is not a national one, e.g., some American surgeons use one, and others the other method of anæsthesia.—[P. L.].

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Rectum and Anus.—A most instructive demonstration on congenital malformations was given by Keith at the Royal College of Surgeons of England, based upon a detailed examination of 114 specimens in the Hunterian and other large pathological museums of London.

Prof. Boas, of Berlin, advocates a bloodless treatment of hæmorrhoids based upon the spontaneous cure which ensues by natural process; when piles become prolapsed and gangrenous from inflammation or muscular strangulation, he encourages the patient to keep them outside the anus, if possible, until inflammatory œdema prevents their return, or if this is found to be impracticable, he employs Bier's suction apparatus to hasten the œdematous swelling.

Major Porter, R.A.M.C., recommends the injection of 10 per cent of Barker's solution into the external sphincter on each side of the anus

fifteen minutes before general anæsthesia is commenced in operations for piles; he claims that this assists the operator greatly by rendering the anus patulous, and allows of a much smaller quantity of the anæsthetic being used.

W. E. Miles, discouraged by the frequency of recurrence of cancer after perineal and sacral excision, has abandoned this route in favour of a complete combined abdominal and perineal procedure. He states that he has performed the operation twelve times, with a mortality of 41·6 per cent. He describes fully the technique he adopts, which is probably the most essential element of success in this formidable operation.

D'Arcy Power, in a useful article upon ulcerative colitis, lays particular stress on infective colitis as a cause of inflammation and ulceration of the rectum, and considers that many of the so-called "syphilitic" or "tuberculous" ulcerations are of this nature. He believes that appendicostomy, as affording an opportunity of completely flushing out the colon, gives promise of better results than have hitherto been obtained.

C. F. Martin gives details of 87 cases in which spinal anæsthesia was used in rectal surgery; he considers it to be eminently suitable for these operations, owing to the complete muscular relaxation and the entire absence of venous engorgement; he gives a timely caution against elevating the patient's hips.—[C. B. B.]

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Urinary Surgery.—The bulky urological literature of the year makes it evident that this particular section of surgery is making very definite and rapid progress. Five years ago there was only one society—French—which devoted itself to the problems of the diseases of the urinary tract. Now nearly every great nation has not only its special society but also its yearly congress. Again, some years ago the workers in this field concerned themselves more with the diagnosis and technique of operative procedure; now the great congresses appear to aim more at the acquisition of operative judgment, for they debate the psychological moment for judicious operative interference with the progress of disease. When any section of surgery has passed through the "why" and the "how," and has reached the "when," it may be gathered that that section has left the weakness of its childhood for the vigour, the force, and the judgment of commencing maturity.

Among the many lesser matters which have attracted attention and evoked discussion during the year, may be mentioned anterior nephropexy. This, the method of fixing of the kidney through an anterior incision, was suggested independently by Harlan, of Cincinnati, and Stanmore Bishop (*vide Medical Annual*, 1908, *page* 343.). It is evidently growing in favour, though the procedure is not easy in fat subjects nor in those where only a slight mobility of the kidney exists. There is also a valuable method of fixing the lower end of

PLATE XXII

ACANTHOSIS NIGRICANS

E. Graham Little, M.D.

PLATE XXIII

ACANTHOSIS NIGRICANS

E. Graham Little, M.D.

the ureter into the bladder after its continuity has been accidentally destroyed.

Another matter which is forcing itself upon the notice of surgeons is the relief of patients suffering from the agonizing pain of slow-growing tumours of the bladder, and of the irreparably contracted bladder. Van Hoogen, of Brussels, has isolated the cæcum and attempted to make it fulfil the office of a bladder, either with or without the appendix as a new urethra: the old diseased bladder being removed. This novel but heroic measure has not been rewarded by success as yet, and the method of ureterostomy or nephrostomy, combined with removal of the bladder (*vide Medical Annual*, 1909, *p.* 160), still holds for those rare instances where such a procedure might justly be advised to relieve pain and prolong life.

A valuable suggestion of perineal drainage of the prostatic capsule after removal of the enlarged prostate has been simultaneously and independently made by Ransohoff and Lynn Thomas, and is worthy of thoughtful consideration and trial where there are conditions necessitating free and prolonged drainage of the cavity. Lastly, and worthy of notice, though the scheme is Utopian, is the temporarily successful transplantation by Unger of the entire urinary tract, with its vessels, from one dog to another.—[E. H. F.]

ABSCESS OF LIVER. (*See* LIVER ABSCESS.)

ACANTHOSIS NIGRICANS. *E. Graham Little, M.D., F.R.C.P.*

This exceedingly rare disease remains one of the curiosities of dermatology, and it is more than a little extraordinary that two cases of it should have been shown at the Belfast meeting of the British Medical Association. The first, under Dr. Wild,[1] occurred in a man aged 39, a sugar-boiler. He came under observation for a tumour above the left clavicle in February, 1908. This was excised and proved to be malignant. He had, at the same time, scattered over the body, multiple warty growths, which also invaded the mucous membrane of the nose, lips, and cheeks. There was further, deep pigmentation on the neck, in the axillæ, and about the genitals. The skin covering the hands and fingers was thickened, papillomatous, and pigmented. The patient died, apparently of bronchitis, a few weeks after he was first seen; no post-mortem examination was allowed. The second case was shown by Drs. St. George and Melville,[2] the patient being a woman aged 42. The disease had commenced about twenty months earlier with deep black pigmentation, warts following later. No deposits of cancer tissue could be made out in the case, and the patient was still living.

Plates XXII and XXIII show the clinical appearances of a case recorded by me in 1901,[3] the patient being a man aged 60, a field labourer, who subsequently died with symptoms of rectal carcinoma. No post-mortem, however, was allowed. The reproduction shows very faithfully the pigmentation, and the innumerable warty

growths; the hands and feet were covered with greatly thickened, hardened skin. Sections of some of the superficial papillomata showed quite benign growths with no epitheliomatous change. The noteworthy character of acanthosis nigricans is, that in a preponderating number of instances (25 out of 30, Darier) cancer of the abdominal cavity has been found in association with the cardinal objective symptoms of warty growths and pigmentation. Treatment seems quite unavailing.

REFERENCES.—[1]*Brit. Jour. Derm.* Nov. 1909; [2]*Ibid.*; [3]*Ibid.* Nov. 1901.

ACHYLIA GASTRICA. (*See* STOMACH, DISEASES OF.)

ACNE VULGARIS. *E. Graham Little, M.D., F.R.C.P.*

Treatment by Vaccines.—Fleming,[1] working in Wright's laboratory at St. Mary's Hospital, describes some important investigations on the etiology of acne vulgaris. He regards the so-called "acne bacillus" as the cause, and describes it as a small, Gram-staining bacillus varying in length from 1 to 4 μ, and $\frac{1}{2}$ μ wide. They are more easily decolorized when stained by Gram than are cocci. Smears from acne pustules practically always show the bacillus either alone (44 per cent) or with staphylococci (53 per cent). The bacillus grows with some difficulty on ordinary media. The technique of inoculation was as follows: The skin was sterilized by wiping it over with pure lysol and then with spirit; the pustule was pricked, the contents were squeezed out, and a loopful was transferred to an acid agar slope and spread thickly over the surface. The bacillus grows very slowly on this medium, a week or even a fortnight being required to show any considerable growth. A temperature of 37° is necessary for growth, which ceases at room-temperature, and the organism is killed at 75°. Of the ordinary media, acid agar was the best, but Fleming has devised a special medium which he has called oleic acid glycerin agar, on which the bacillus grows well within two days. It was found possible to produce typical follicular acne (from which the bacillus was afterwards recovered) by rubbing into the forearm of a person who suffered from acne a broth culture of his own bacillus, which failed to produce any effect in a quite healthy person. Some special susceptibility must therefore be assumed. The staphylococcus, which, as has been stated, is so frequently found in association with the acne bacillus, is the white variety. Fleming considers the acne bacillus is itself pyogenic, since pustulation occurs when this is the only organism found.

For therapeutic purposes, acne cases may be divided into three classes: (1) When the comedo is the dominant lesion, with little or no inflammation; here the acne bacillus vaccine alone is required. (2) Indurated and pustular varieties; here the mixed vaccines of acne and staphylococcus should be used. (3) Acute furuncular conditions supervening on acne; here the staphylococcus vaccine alone may be used. In all cases a preliminary smear should be taken, to ascertain which variety is present. Opsonic estimations show the characteristic variations of negative phase followed by a rise and

PLATE XXIV

ACNE VULGARIS

Showing the concomitant seborrhœa in an unusual degree

Photo. by Dr. W. Kenneth Wills

PLATE XXV

ACNE SCROFULOSORUM NECROTICA

Photo. by Dr. W. Kenneth Wills

subsequent drop, and the clinical symptoms correspond with these observations, the lesions being most copious when the index is low. Injection of from 6 to 10 millions is the safest dose to be given, at intervals averaging ten days. The advantage of making the culture from the patient's own lesions is very great, but stock cultures are indubitably useful in a large majority of cases. Improvement amounting to cure has been obtained within three months, even in severe cases.

Fleming,[2] in a second communication, concludes : There is no doubt of the presence of the bacillus to which he would sanction the ascription of the name " acne bacillus " in the lesions of acne vulgaris, the same bacillus being present in almost all skins, but in the great majority of cases producing no symptoms. The pathological effect of the bacillus in producing acne in some cases and not in others must probably be ascribed to some decrease of individual resistance. The acne bacillus alone can probably cause suppuration, but in the deeper and more nodular suppurative lesions staphylococci are a secondary contamination. For the treatment of acne by **Vaccines,** suspensions of the acne bacillus should be used, combined with staphylococcus only when the latter organism is present in numbers indicating a pathological production. Inoculations of from 5 to 10 million acne bacilli, of from 200 to 500 million staphylococci, should be given at intervals of about seven days, sometimes perhaps of five days. (*See also* SKIN DISEASES, THERAPEUTICS OF.)

Dr. Kenneth Wills has kindly lent me a stereoscopic photograph, which shows well the excessive oily seborrhœa in association with severe acne vulgaris (*Plate XXIV*).

REFERENCES.—[1]*Lancet*, Apr. 10, 1909 ; [2]*Brit. Med. Jour.* Aug. 28, 1909.

ACNITIS. *E. Graham Little, M.D., F.R.C.P.*

This, the name given by Barthélemy, has been selected from a number of titles which have greatly confused the subject. Schamberg[1] reports a new case. He attempts an enumeration of previous cases which is far from complete ; several cases, e.g., have been shown in London since 1900, the last date at which he records one. The disease, however, remains very rare, and its etiology is much debated. Whether acnitis is of the same type of disease as " folliclis," as French authors with the exception of Barthélemy affirm, is as yet unsettled ; Schamberg regards these diseases as unconnected, and believes acnitis to be non-tuberculous. His histological examination showed nodules rather like those of lupus ; no tubercle or other bacteria were identified, and inoculation experiments in guinea-pigs proved negative. The eruption is often associated with ill-health ; it is of acute onset, involving the face especially, with sometimes slight fever. The characteristic lesion is a follicular papule which becomes of a brownish-red colour, usually undergoes necrosis in the centre, and leaves a varioliform scar. The papules are grouped, and are found especially on the chin, upper lip, eyelids, malar region, and

temple and forehead. They may be extremely numerous—the patient who forms the subject of the paper had as many as 495 on the face alone. The disease appears at times to undergo spontaneous involution in the course of months, but may persist for years. Intestinal antisepsis seemed to produce most improvement. No local treatment short of curetting has much effect. Schamberg regards the disease as *sui generis*, non-tuberculous, and possibly a "parasitic granuloma."

Dr. Kenneth Wills has kindly furnished me with a stereoscopic photograph of a case of acne scrofulosorum necrotica on the back of a girl, the subject of phthisis. This was relieved entirely with a few doses of X rays, the ulcers healing, the pustules discharging, and the comedones shedding (*Plate XXV*).

REFERENCE.—[1]*Jour. Cutan. Dis.* Jan. 1909.

ACTINOMYCOSIS, PULMONARY.

Joseph J. Perkins, M.A., M.B., F.R.C.P.

Norman Bridge,[1] writing from Los Angeles, California, reports eight cases, all of which, as far as could be ascertained, were primary in the lung; in three, tuberculosis was present in addition, but evidently as a secondary infection.

SYMPTOMS.—Except in one case, which followed the bronchitic type, and presented the signs of emphysema and bronchitis only, the symptoms and physical signs, but for one point of difference, were those ordinarily associated with tuberculosis: fever, cough, hæmorrhage, (which at times was severe) and emaciation, with consolidation and softening of the lung. The one point of difference was to be found in the expectoration; not only was this profuse, and purulent but it tended to become *fœtid*, a feature unknown in pure tuberculosis.

DIAGNOSIS.—In some, the diagnosis made itself from the presence of the characteristic yellowish-brown spherical granules in the expectoration; but more often the mycelium had to be demonstrated microscopically after staining, no visible granules being found.

THE TREATMENT followed was the administration of **Potassium Iodide** or **Copper Sulphate** ($\frac{1}{3}$ gr. t.d.s.), in many instances with benefit. No mention is made of the use of a vaccine.

From this experience of eight cases occurring in one man's practice in a year, Bridge is inclined to argue that pulmonary actinomycosis would be found to be more common than is at present believed, if a routine examination were made of the expectoration of patients. There was no question of an infection from a common focus in these cases, and in only one instance had the patient to do with farm work. It must be remembered, however, that a health-resort like Los Angeles draws from a very wide area. The present writer's own experience leads him to confirm Bridge to a considerable extent, and certainly in all cases of fœtid expectoration, at any rate, if the origin of the disease is at all obscure, a search should be made for actinomyces.

REFERENCE.—[1]*Med. Press*, Nov. 25, 1908.

ALOPECIA AREATA. *E. Graham Little, M.D., F.R.C.P.*

Rousseau-Decelle,[1] working at Jacquet's suggestion and with much of his material, has investigated the association of alopecia areata with a "painful crisis of the trigeminal." Jacquet noted the association in 27 out of 200 cases of alopecia, Rousseau-Decelle in 18 out of 70 cases. Alopecia appears on the same side as the nervous affection, and the left side is more frequent than the right, alike for alopecia and trigeminal pain. Certain sites of dental pain are associated with definite areas for alopecia, e.g., eruption of the "wisdom" teeth with alopecia of the neck; alopecia of the chin with pain localized in the canines or premolars; dental troubles involving the upper jaw with frontal or parietal alopecia. The alopecic areas are roughly identical with Head's areas of referred pain from dental causes. The most usual dental condition associated with alopecia seems to be a chronic indolent alveolar arthritis. In 19 out of 25 cases reported by the author, growth of hair took place within six weeks of the teeth being properly treated; in 3 cases, within three months.

REFERENCE.—[1]*Bull. et Mém. Soc. Méd. d. Hôp. de Paris*, Jan. 15, 1909.

AMŒBIC DYSENTERY. (*See* DYSENTERY.)

AMPUTATIONS. *Priestley Leech, M.D., F.R.C.S.*

Hip Joint.—Roughton[1] and Legg[2] each report a case of amputation at the hip joint where the hæmorrhage was controlled by means of intraperitoneal compression of the common iliac artery. It is not a new method, but deserves to be more widely known. McBurney was the first to describe it.[3] The common femoral artery and vein can first be tied by an incision over them, though this is not necessary. In order to compress the common iliac an incision is made through the outer third of the sheath of the rectus, the muscle being displaced inwards; a clip may be placed on the deep epigastric to control any collateral circulation from the internal mammary. The incision through the posterior sheath and peritoneum should be just large enough to admit two fingers comfortably. The index and middle fingers are introduced, and placed on the common iliac artery in such a way that the tip of the longer middle finger reaches just beyond the vessel, whilst the tip of the shorter finger just reaches to the middle of it. In this manner the artery is safely pinned against the vertebral column and cannot slip away. The pressure of the fingers may be reinforced by the disengaged hand laid outside the abdominal wall. Every blood-vessel severed in amputation of the hip joint can thus be absolutely and certainly controlled without interfering with the operator, and the only additional risk is the slight one of opening the abdominal cavity.

Gritti's Amputation.—Wainwright[4] thinks that this method gives a very satisfactory stump, and believes that it is much preferable to any form of amputation which leaves a tibial stump less than 6 or 8 in. long. He has performed it successfully in two cases by means

of regional anæsthesia with stovaine by the following method: A solution of stovaine of 2 or 4 per cent, according to the quantity used. After the usual cleansing, the skin of the upper angle of the popliteal space is infiltrated with the solution. A skin incision about 2 in. long is then made in the upper angle, and the external and internal popliteal nerves are easily found in this situation. A few drops of stovaine solution are applied to the nerves, and after waiting a moment, a small hypodermic needle can be thrust into the nerve trunks and enough of the stovaine injected to cause a marked swelling of the nerve trunk. Both nerves being thus treated, the popliteal artery is identified in the upper angle of the wound and ligated; the leg is then elevated to allow as much blood as possible to flow back into the general circulation, and the vein ligated. The next step is to carry the longitudinal skin incision straight down the popliteal space to the level of the tubercle of the tibia. An incision is now carried straight across the front of the leg on a level with the tubercle; if ether is not used, it is necessary to infiltrate this incision. The skin flap thus outlined is dissected up for a short distance until the ligamentum patellæ is exposed; the knee joint is then opened through the ligamentum patellæ, all the capsular structures cut away, and the tissues in the popliteal space cut straight across on a level considerably below the point of injection of the nerves and the ligation of the artery; this leaves the head of the femur projecting from the wound. The entire head is sawn off sufficiently high for the patella to come down over it without tension. After the cartilaginous surface of the patella has been sawn off the two bones can be fixed in apposition by sutures through the periosteum and fascia, and by heavy chromic gut stitches through drill-holes in both bones.

Interpelvi-abdominal Amputation.—Hogarth Pringle[5] reports three cases of this operation; he can only find reference to 21 recorded cases. The indications for it are malignant neoplasms and certain infective processes involving the pelvic bones. The malignant neoplasms are sarcomata of the highest part of the femur and of the pelvic bones (usually the ilium) or of the muscles and fascia in the immediate neighbourhood. All these structures may be affected primarily or secondarily after an amputation of the limb for similar disease lower down. Out of 21 cases operated on, 18 were for sarcoma, and only 5 survived the shock of the operation. Three operations were performed for tuberculosis, and only one survived. Pringle's patient was operated on under spinal stovaine anæsthesia, and recovered, but died five months later from metastases. The operation might also have to be done for actinomycosis. In cases of tuberculous disease Pringle thinks it is perhaps better first to amputate at the hip and scrape away what disease can be found, and at a second operation to remove the ilium if this be found necessary. Unless diseased, it would seem to be better to leave the body of the pubic bone. As regards preliminary tying of the common iliac artery, it is doubtful whether this is advisable, and Pringle is of opinion

that in future operations of this kind, where shock is the great danger to be avoided, it will be best for the patients to use spinal rather than a general anæsthetic.

REFERENCES.—[1]*Lancet*, Apr. 3, 1909; [2]*Ibid.*; [3]*Ann. Surg.* Aug. 1894; [4]*Ibid.* Dec. 1908; [5]*Lancet*, Feb. 20, 1909.

ANÆMIA, PERNICIOUS. *George Lovell Gulland, M.D.*

J. Aitken[1] reports two cases of typical pernicious anæmia, in which pigmentation of the skin was an early and marked feature. In one the pigment was very widely distributed over face, arms, legs, and the lower part of the abdomen, but there was no increase of pigmentation in nipples or axillæ. There were, in addition, numerous pigment spots on the buccal mucous membrane. In the other case, the pigmentation was slighter in amount, was distributed in spots in much the same positions as in the first case, but not in the mouth; in neither was there a post-mortem examination. In some similar cases which have been examined, disease of the suprarenal has been found, in others these organs were healthy. Aitken gives a synopsis of the literature of pigmentation in pernicious anæmia. [In my experience pigmentation of the skin is by no means uncommon in pernicious anæmia. Indeed, I am accustomed in teaching to insist on the importance of blood examination in supposed cases of Addison's disease, because of this fact. The darkening of the skin is usually ascribed to arsenic, but it is often well marked before any arsenic is given, is not always increased by it, and sometimes becomes steadily more marked in cases treated without arsenic. In these pigmented cases I have never found any affection of the suprarenal capsules.—G. L. G.]

H. French[2] discusses various clinical points, and insists specially on the following: (1) That slight evening pyrexia is seldom absent in cases of pernicious anæmia that are decidedly ill; (2) That pigmentation within the mouth of precisely similar character to that seen in Addison's disease, may occur in cases treated with arsenic; (3) that the spleen is to be felt in about one-third of the cases, and that it is really enlarged; (4) That nerve symptoms are not at all uncommon; (5) That the colour index of the blood, though typically high when an advanced stage of the disease has been reached, is not always nor continuously high, especially during a period of improvement, when it may be actually low; (6) That pernicious anæmia, as we know it, is very possibly only a late and almost incurable stage of a disease which it is to be hoped will some day be recognizable early enough to be cured.

TREATMENT.—C. H. Melland[3] very properly insists on the importance of careful treatment. The disease is too commonly looked upon as inevitably and speedily fatal, which is only true in a small proportion of the cases. Early diagnosis is essential, and during the periods of remission the patient should be under medical supervision. Melland regards the combination of **Arsenic** and **Antiseptic Treatment** as most

useful, but has seen two cases in which **Red Bone-marrow** gave good results when the other methods failed.

C. E. Simon[4] reports the results of six cases treated with **Cholesterin,** the idea being to counteract any hæmolysins which might be active, in a manner analogous to the action of cholesterin on cobra lecithin. Five cases were advanced; in these there was no effect whatever. In the sixth case there was apparent benefit, but it was her first attack. In a relapse some months later, cholesterin was again used, with excellent results. The best method of administration is as a 3 per cent solution in olive oil, of which 100 grams are given daily, i.e., 3 grams of cholesterin. The substance is costly, about two shillings per gram. It is quite free from toxic effect.

G. Klemperer[5] discusses the cholesterin treatment, which, on account of its cost, he was not able to carry out fully. He considers, however, that, if it is really to be regarded as an agent arresting hæmolysis, its place can be taken by a diet rich in butter, cream, and milk, which contain a certain amount of cholesterin. For example, if a patient can take a litre of cream and 200 grams of butter in the day, he receives 2·1 grams of cholesterin. These large amounts cannot always be taken, of course. For mild cases, he uses in addition the ordinary arsenical preparations, but for severe ones prefers **Arsacetin** (acetyl–atoxyl). This is injected subcutaneously in 10 per cent solution. He obtained the best results by giving 0·6 grams, i.e., 6 ccm. of the solution, on two consecutive days, then desisting for a week, and then proceeding in the same way. Improvement was generally maintained until 4·8 grams had been given, but then did not proceed further. Unpleasant results may occur, especially in women —sickness, diarrhœa and fever. [In two cases which I treated in this way, severe herpes zoster occurred. In these and in others, I was not able to convince myself that improvement was more rapid or better maintained than in cases treated with arsenic by the mouth. —G. L. G.]

Nicolayson[6] reports a successful case treated by **Crawitz's Method,** which consists in a strict diet of milk and vegetables, daily enemata, with arsenic and hydrochloric acid given by the mouth. Lavage of the stomach on alternate days is part of the original method, but was omitted in this case. The view taken of the disease is that it is a toxæmia caused by a deficiency of hydrochloric acid in the gastric juice and a possible subsequent splitting up of albuminous molecules into toxic bodies. Crawitz in his original article described five successful cases. [It must be remembered that, although in the great majority of cases hydrochloric acid is absent from the stomach contents after a test meal, in a small proportion of cases it is present in varying amounts, and, very rarely, even in excess.—G. L. G.]

REFERENCES.—[1]*Brit. Med. Jour.* June 5, 1909; [2]*Clin. Jour.* May 12, 1909; [3]*Brit. Med. Jour.* June 5, 1909; [4]*Jour. Amer. Med. Assoc.* Dec. 19, 1908; [5]*Berl. klin. Woch.* Dec. 28, 1908; [6]*Norsk. Mag. f. Laegevidursk,* Oct. 1908, in *Lancet,* Nov. 7, 1908.

ANÆMIAS OF INFANCY. *George Lovell Gulland, M.D.*

Morse[1] points out that while the red count of infants is high, varying between 5,500,000 and 6,000,000 per cmm., the hæmoglobin is relatively low, ranging from 55 per cent at one month to 70 per cent at six months, and remaining at the latter figure for the rest of infancy. This is due to the facts that iron is present in relatively small amount in the food of infants, and that the reserve of iron in the liver at birth is not enough to keep the hæmoglobin up to adult standard. Almost all infantile anæmias show a low percentage of hæmoglobin, and **Iron** is therefore specially indicated. It is not always easy to get infants to take a sufficient amount of this by the mouth, and when taken in that way it is apt to disturb the digestion. Morse has had excellent results in both mild and severe cases, by giving iron subcutaneously as the citrate in aqueous solution. He advises that it should be put up in pearls, each containing the required dose. These remain sterile indefinitely. The solution is unirritating, and is never followed by induration or abscess, though the injection sometimes gives rise to pain lasting from a few minutes to an hour. A sterilizable glass syringe, with asbestos packing, and a platinum needle, are necessary ; the solution corrodes an ordinary steel needle. The average dose during infancy is $\frac{3}{4}$ gr. every other day.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* July, 1909.

ANEURYSM. *Carey F. Coombs, M.D., M.R.C.P.*

ETIOLOGY.—The exact part played by *syphilis* in the production of aortitis, aneurysm, and aortic insufficiency is of some importance in regard to treatment. Brockbank,[1] in 182 cases of aneurysm examined post mortem, found evidence of syphilis in 35 only. This, however, is evidently too low. More help is to be expected from methods which discover the presence of lesions which would not necessarily be apparent in a routine post-mortem examination. Such a method is to be found in the Wassermann test. Schülze[2] applied this in twelve cases of aortic disease with or without tabes dorsalis. In eleven the reaction was positive, these patients being therefore syphilitic ; the twelfth was a " declared " syphilitic, with tabes as well as aortic disease. Citron,[3] who alludes to Chiari's discovery of mesaortitis in more than 40 per cent of the syphilitics examined post mortem, tested a series of cases of aortic regurgitation without mitral lesions (40 per cent of whom gave a history of syphilis) by the Wassermann method, and gained a positive reaction in 62·5 per cent. Collins and Sachs[4] also found a positive reaction in all five cases of aneurysm examined, and in twelve out of thirteen cases of aortic disease. Among seven cases of mitral disease only one positive reaction was obtained.

Egidi,[5] by experiment, has satisfied himself that the action of *adrenalin* in the production of focal necroses in the rabbit's aorta is not quite comparable to the development of regressive areas on the diseased aorta ; further, that this action is not dependent on the rise of blood-pressure which follows the intravenous injection of adrenalin.

Symptoms.—MacPhedran and Lemon[6] record a case which emphasizes the importance of persistent intercostal pain as an early symptom of thoracic aneurysm. The same point is insisted on by Hewlett and Clark[7] in an article on the diagnosis of descending thoracic aneurysm. It is generally left-sided, and often associated with objective alterations of sensation, occasionally also with spasm of the rectus abdominis. Sometimes it is increased by dorsal decubitus. The physical signs of descending thoracic aneurysm are so indefinite that if there is any suspicion of its presence a skiagraphic examination should be made.

Blume,[8] in an article which summarizes the whole subject, states that *aneurysm of the sinus of Valsalva* cannot be diagnosed during life, though its presence might be guessed if in a case of aortic regurgitation sudden collapse occurred, with signs of internal hæmorrhage. Rupture is the common termination, generally into the pericardium or the right heart.

Prognosis.—French[9] records a case which encourages the belief that aneurysms may sometimes be "cured" by the deposition of clot within the sac. The presence of an aortic aneurysm was not detected in life, but autopsy showed one arising from the ascending aorta and flattening the right pulmonary artery. It was as large as a tennis ball, and packed with hard clot. Oliver[10] describes a similar case.

Treatment.—Ambrose[11] records improvement under treatment by calcium chloride 15 gr. three times daily in a case where the diagnosis was confirmed by radiography. Pain disappeared, pulsation lessened, and huskiness and dysphagia were mitigated. Robin[12] also recommends calcium chloride with opium in the hæmoptysis of aneurysm. He advocates venesection for the relief of aneurysmal dyspnœa.

References.—[1]*Med. Chron.* May, 1909; [2]*Deut. Zeits. f. Chir.* 1908, xcv. 1–5; [3]*Berl. klin. Woch.* Nov. 30, 1908; [4]*Amer. Jour. Med. Sci.* Sept. 1909; [5]*Il Policl.* (sez. med.) Aug. 1909; [6]*Canad. Jour. Med. and Surg.* May, 1909; [7]*Amer. Jour. Med. Sci.* June, 1909; [8]*Berl. klin. Woch.* July 12, 1909; [9]*Lancet*, July 10, 1909; [10]*Ibid.* Apr. 3, 1909; [11]*Australas. Med. Gaz.* Aug. 20, 1908; [12]*Jour. Méd. de Paris*, Dec. 26, 1908.

ANEURYSM, POPLITEAL. *Priestley Leech, M.D., F.R.C.S.*

Rigby[1] reports two cases successfully operated on by the method of Matas. Some 85 cases of aneurysm have been collected in which this procedure has been used; of these only one came from an English clinic. 50 were cases of popliteal aneurysm, and the results were: 1 death from tetanus; 2 cases of gangrene (in one of these the vein was ligatured); there were 3 relapses (all these occurred in the reconstructive operations). In 1 case secondary hæmorrhage occurred, and led to subsequent amputation of the leg. In the obliterative operations there were no relapses, no secondary hæmorrhage, and sound cures were obtained in all the others. Rigby compares these results with 20 cases of popliteal aneurysm treated in the London Hospital: 9 of these were treated by ligature of the artery in Hunter's canal; in

1 pulsation returned in the sac, which was excised at a second operation with a good result. In 3 gangrene followed (33⅓ per cent); 2 of these 3 cases required amputation of the thigh; in the other the gangrene was limited to the toes, which gradually separated. Three were treated by ligature of the artery in Scarpa's triangle with good results. Three were treated by ligature of the first part of the popliteal artery; one case of gangrene of the toes followed (33⅓ per cent). One was treated by ligaturing the artery above and below the sac, with opening of the sac and turning out the clot; secondary hæmorrhage, ligature of another vessel, recovery. One case was not operated on. In two cases of ruptured sac, amputation was performed in one and the sac excised in the other; this latter died of uræmia. Matas' operation therefore seems to give the best results.

REFERENCE.—[1]*Clin. Jour.* Aug. 4, 1909.

ANGINA PECTORIS. *Carey F. Coombs, M.D., M.R.C.P.*

A clinical lecture by Marchiafava[1] affords a good basis for the discussion of some of the points referred to in the year's papers on this subject.

ETIOLOGY.—He accepts the theory which makes atheroma of the coronary arteries the essential lesion. Clifford Allbutt,[2] on the other hand, believes that the pain of angina is produced in the suprasigmoid part of the aorta; he considers that it is rarely fatal directly except by way of reflex vagus inhibition (in the same way as a blow in the epigastrium may be fatal), death in angina being generally due to the coronary and myocardial lesions which are such constant accompaniments of aortic disease. In this belief he is supported by Josué.[3] Osler and Douglas Powell, in discussing Allbutt's theory, declare their adhesion to the coronary hypothesis. According to Marchiafava and Kerr[4] there is a form of angina due to excess in tobacco; but this, Morison[5] thinks, is not a large group.

Daland[6] calls attention to the unhealthy habits common in those persons who are most often victims of angina, middle-aged men who eat excessively and follow occupations which, while overtaxing their mental powers, provide an insufficient allowance of physical exercise.

Marchiafava[1] finds that not only does the amount of exertion needed to provoke an attack vary in different patients, but also the time of day at which attacks are likely to occur. Cold, damp weather is associated with increased frequency of attacks, also menstruation.

Kerr[4] considers that many attacks of "cardiac asthma" are really a "painless form of angina" due to disease of the wall of the right ventricle.

TREATMENT.—Marchiafava lays the necessary stress on abstinence from tobacco and alcohol, and recommends the administration of **Iodides**, the **Nitrites**, and **Theobromine.** Iodide of potassium should be given in large doses if there is a history of syphilis, in small doses for middle-aged arteriosclerotics, and not at all to aged persons. Nitrites he finds ill borne by some, and claims that theobromine, in doses of 7½ gr. twice daily, is efficacious in preventing arterial spasm.

It is well borne, and can be given continuously for months. The same drug will, it is said by Egidi,[7] prevent the aortic lesions caused by administering adrenalin to rabbits, if given concurrently.

Morison[5] discusses the treatment of angina pectoris along the lines of its causation. He considers that there are three causative factors, operating in varying proportions in different individuals. In cases where there is reason to believe the *myocardium* diseased, attacks are to be treated by **Nitrites**; if these fail, by **Morphia with Atropine**; if this does not suffice, he recommends a general **Anæsthetic** such as ether or chloroform. In cases where there is a predominant *nervous* factor, where, that is to say, the pain is out of proportion to other evidences of disease of the cardiac muscle, the **Anodyne** or general anæsthetic plan should be adopted fearlessly. The third or *hæmic* factor evident in the cardiac pain of anæmic women, is best treated by **Arsenic**; the "uric acid diathesis" also provokes angina, to be got rid of in this instance by **Dieting.** (See also notes of treatment of angina under BLOOD-PRESSURE, (p. 176).

REFERENCES.—[1]*Il Policl.* Feb. 28, 1909; [2]*Lancet*, July 31, Aug. 14, 21, 1909; [3]*Arch. des Mal. du Cœur, des Vaisseaux, et du Sang*, Oct. 1908; [4]*Jour. Amer. Med. Assoc.* May 29, 1909; [5]*Clin. Jour.* June 23, 1909; [6]*N.Y. Med. Jour.* Mar. 20, 1909; [7]*Il Policl.* (sez. med.) Aug. 1909.

ANKYLOSTOMIASIS. *J. W. W. Stephens, M.D.*

In a discussion on this subject[1] Manson considered the question of prophylaxis under three headings:—(1) *Expulsion of the worm:* For wholesale use **Beta Naphthol** is the best drug, as it is less toxic than thymol and nearly five times as cheap; but eradication of ankylostomiasis from a community by this means is hardly feasible. (2) *Prevention of contact with fouled ground*: The use of boots, tarring of the feet, etc., are hardly possible as a general measure. (3) *Disposal of fæces*: Though difficult where natives in scattered communities have to be dealt with, yet in the enforced use of a latrine probably lies the most practical method of stamping out ankylostomiasis.

W. F. Law described the method of treatment adopted in British Guiana. The patient is kept for a day or so on milk diet. He is then given a small dose of calomel, followed by a saline aperient. The following morning thymol, 20 to 30 gr., is administered in a cachet, and this dose is repeated twice, at one hour's interval between each dose. β-naphthol is now used instead of thymol, given in the same way and about the same dose. *Prophylaxis by latrines*: The author says the system works well where the fæces are ejected into a trench that can be flushed by river or sea water, but where there is no water available for flushing, the fæces should be removed in pans and buried, which entails expense.

Nathan Larrier uses the following treatment: First day, milk diet and saline purge. Second day, milk diet; 20 capsules containing each 0·3 egram of oil of **Filix Mas.** A quarter of an hour after the last capsule, 8 capsules of ether, one every three minutes. After the last ether capsule 15 grams of castor oil, and half an hour later 25 grams

of castor oil. Third day, saline purge. Fourth day, examination of stool and, if necessary, repetition of treatment. The first treatment gave 50 per cent of successes, the second 90 per cent.

F. M. Sandwith pointed out that it was often necessary to strengthen a patient before giving a toxic drug like thymol. **Strychnine** was of great value, and might be combined, when a speedy result was required, with hypodermic injections of camphor in sterilized oil (1–10). They might be used alternately. Prophylaxis could be carried out most cheaply by early burial of the fæces in dry earth or sand (the larvæ not developing without moisture).

Manson, in winding up the discussion, pointed out the importance of combining an anæsthetic with an anthelmintic, e.g., chloroform with eucalyptus, ether with filix mas. His sanitary scheme comprised: (1) The election of a headman in villages or districts who would be responsible for carrying out local measures; (2) That he be responsible to the district surgeon, and the latter to the surgeon-general of the colony; (3) An inspector-general of ankylostomiasis sanitation, supervising a group of colonies and responsible to the Secretary of State.

V. G. Heiser[2] points out the great reduction in mortality which has been effected by active therapeutic measures taken against intestinal parasites. In Bilibid prison, under organized hygienic measures, the mortality was reduced from 20 per cent to 7·5 per cent. Microscopic examination of the fæces of the prisoners then showed that 84 per cent were infected with parasites; of these 60 per cent had hook worms, 59 per cent had whip worms, 23 per cent amœbæ, and 21 per cent some other parasite. Active measures were then taken to get rid of these parasites, with the result that the death-rate fell to less than 2 per cent.

A most striking fact noticed at the same time was that there was also a marked reduction in the incidence of all diseases, showing that parasitic diseases are not only directly harmful, but lower the resistance of the system to other diseases. In the Philippines it is proposed to introduce a pail system, the contents to be emptied into pits, where the fæces will remain for at least six months, after which it is to be used for fertilizing mulberry trees. It is thought that the campaign in Manilla against hook-worm disease will result in the saving of over 2000 lives per annum.

References.—[1]*Brit. Med. Jour.* Oct. 31, 1908; [2]*N.Y. Med. Jour.* Feb. 13, 1909.

ANTHRAX.

(*Vol.* 1909, *p.* 139)—The specific **Serum** prepared by Professor Sclavo, of Siena, should be given intravenously in doses of 10 to 60 cc. This should be combined with **Excision** of the infected area, and **Cauterization** of the wound by the application of **Perchloride of Mercury.**

APHONIA, HYSTERICAL.

(*Vol.* 1909, *p.* 141)—Crouch gives a series of detailed directions for restoration of voice by means of singing lessons, combined with isolation in the company of a suitable nurse. When the singing voice is partly restored, the patient should be taught to intone, then to read aloud.

APOPLEXY. (*See* HÆMORRHAGE, CEREBRAL.)

APPENDICITIS. *Rutherford Morison, F.R.C.S.*

In the majority of cases the diagnosis of appendicitis, if care be taken, is easy. It is well first to remember that the greatest number of attacks of abdominal pain, more than ordinarily severe, are due to appendicitis. If the pain, after some diffusion, has located itself in the right iliac fossa, if the patient has been sick, has an elevated temperature, localized tenderness over the appendix, and rigidity of the muscles in the right iliac fossa, the appendix is acutely inflamed and distended, the outcome of the illness is uncertain, and every hour dedicated to delay and watching makes the prognosis more serious. No surgeon doubts this. Many have discussed, and still discuss, the question "When to operate in cases of appendicitis," but not one denies that in the early stage, i.e., before perforation, operation is so successful that death following it must be regarded as a surgical calamity. It is when the appendix has leaked, and a localized or diffuse peritonitis has followed, that doubt as to the propriety of immediate operation may be entertained. There can be no doubt here. An attack heralded by such symptoms and signs is one of severe appendicitis, and the only reasonable treatment is to remove the appendix before it bursts and causes serious complications. The rule then, with so few exceptions as only to prove it, is that the wound heals by first intention, and that at the end of a month the patient is fit for work.

But the symptoms and signs are not always sufficiently definite to allow of such prompt action. In the case of children, not infrequently the diagnosis is so difficult—for the signs may be misleading—that an opinion may have to be based on probabilities, and be largely guess-work. This is unfortunate, as early operation is specially indicated in them. In adults, after the initial pain has passed, if the appendix is protected by its situation (outer side of colon, subcæcal fossa) or is wrapped up in omentum, all the ordinary symptoms and signs may be absent, and only a tender lump is found to indicate the serious nature of the attack. A little later the rupture of omental adhesions may allow a quantity of putrid matter to discharge into the peritoneal cavity, and set up one of the gravest types of general peritonitis.

What is to be done when the attack is so indefinite as to lead to doubts in diagnosis? Avoid the use of morphia till a definite diagnosis and prognosis can be made, and watch and keep an hourly record of the condition, with a note of each sign, but especially regarding the pulse-rate. If there is a steady increase in the pulse, this alone calls for operation; if at the end of twelve hours there is no improvement in *every* sign, operation is the best course. There are several reasons why this prompt and vigorous action has not yet been universally received by practitioners. The first is that surgical teaching has not been definite enough on the small risk incurred by early operation,

and the great advantages which follow it. The second is that the *mortality* of a disease is rightly regarded as the strongest argument in favour of an operation, and its *morbidity* has scarcely entered into consideration.

It is now universally known that at least 80 per cent of cases of appendicitis will recover if treated without operation, that abscesses can discharge themselves spontaneously into the intestine and allow of recovery, and that even the most hopeless-looking case of general peritonitis may recover without surgical aid. Previous exaggerated stories as to the mortality of appendicitis treated on medical lines have encouraged that reaction against operation which is always certain to follow too alarmist statements. The truth is, however, that every abscess and all peritonitis put the patient in serious danger, that both are only likely to recover after a prolonged, painful, and dangerous illness, and that both the high death-rate and the large percentage of cases in which abscess and peritonitis occur, still occasion serious reflections upon the promptitude, courage, and skill of our profession. It is necessary to emphasize this, for some doctors hesitate to recommend an operation from fear of what their patients *may* think. This is not fair. No reasonable patient ever hesitates to prefer operation to the alternative if it is explained that the chief object of the operation is to prevent dangerous complications, and if both are fairly offered as they ought to be. Last year (1908), 417 cases of appendicitis were operated upon in the Royal Victoria Infirmary, Newcastle-upon-Tyne, and of these 18 died. They were all patients—chiefly young men and women—in vigorous health at the time of the attack, and it is true to say that not more than two would have died if operation had been performed before the appendix had leaked. The result of delayed operation was, that in addition to the deaths, half of those with acute appendicitis who recovered, did so after a dangerous operation and a serious and prolonged illness, and some of them were damaged permanently by extensive intra-abdominal adhesions or hernia through the scar.

The diagnosis of abscess in connection with the vermiform appendix is made by the history of the attack—that of a sudden pain followed by abdominal dullness and the presence of a definite tender swelling in the right iliac fossa after the third day from the commencement. A careful study of the abscess and its relations can also lead to a diagnosis of the position of the appendix, and thus prove of great value to the operating surgeon. (See a paper of the writer's in the *Lancet*, February 23rd, 1901.) As we have said before, these abscesses may cure themselves by bursting into the intestine, and they do so with considerable frequency, but the risk to life is diminished and the period of illness is curtailed by operation.

What is to be the operation? Drainage of the abscess is the only essential so far as the immediate danger to life is concerned, and all surgeons are agreed that this is necessary. What is not yet agreed upon is what is to be done with the appendix. Probably all agree that if it

makes its appearance in the wound it should be excised. If not, many say no search should be made for it, as barriers against general infection of the peritoneum may be broken down, and the danger of the operation would be much increased. Some surgeons who object to the removal of the appendix during the operation done for evacuation of the abscess, advocate its removal by a second operation when the wound has healed. The question still is largely a personal one. The present writer's belief is that the appendix should be excised whenever possible. He knows he can do it without adding to the risk of the operation during the evacuation of the abscess in 95 per cent of cases, and that is his rule. It is his belief, however, that an inexperienced operator should limit the operation to evacuation of the pus, and that after the wound has healed nothing more should be done unless the appendix remains tender, gives trouble, or threatens to cause another attack, when it should be excised at once. When the abscess is pelvic in position, an exception to this statement must be made, for it is seldom wise to operate from the abdomen. In these cases the pus bulges into the rectum, and when it is ready for operation causes rectal tenesmus, incontinence, with free mucous discharge, and a patulous anus. An opening through the anterior rectal wall is then entirely safe and gives immediate relief.

The form of appendicitis which usually leads to general peritonitis is that variety in which so much stress has been laid on the " quiet interval." The commencement has been stormy, then after a few hours the " delusive lull " occurs, followed later by a serious recurrence of pain and illness, and the development of general peritonitis. The preliminary attack of pain is explained by the tension of an inflamed and distended appendix, and the symptoms produced are similar to those of a strangulated hernia, because they depend upon the same cause, viz., acute distention and vascular disturbance in a piece of bowel. There are acute pain, urgent vomiting, and inability to pass flatus. But there is no hernia, and there is a rise in temperature and marked tenderness and rigidity in the right iliac fossa. The " quiet interval " is due to gangrene or to a small leak in the walls of the appendix. Its tension is relieved, its nerves are killed, and the consequences are that pain disappears and the vomiting ceases. It is the cessation of these troubles that leads to the " delusive lull." The patient appears to be well, indeed the change may be so great as to be described by friends as marvellous; but to the medical man it is relative only. There is always something to guide *him* aright if the case has been carefully considered and each sign studiously noted. It is usually the pulse, or the facial expression, or both. The pulse has not regained its normal state, probably has increased in rapidity, or the face still retains the grey, pinched, anxious look of such serious omen. It often requires courage and conviction to say all is not well when everything looks so promising, and only when the gangrenous or perforated appendix has been demonstrated do they meet with their due reward.

When the gangrenous appendix ruptures, peritonitis begins

Another, though more rare, cause for general peritonitis is the rupture of a localized abscess. In either case the onset is marked by acute pain, vomiting, rise of temperature, increasing pulse-rate, the characteristic facial expression of acute abdominal illness, and tenderness and rigidity of the overlying abdominal wall. As the peritonitis spreads, so do the parietal tenderness and rigidity extend. When the pelvic peritoneum is invaded, in males especially, frequent painful micturition, possibly retention of urine, are complained of. In a later stage the intestines become distended and the signs of intestinal obstruction, more or less complete, develop. More and more the abdominal distention increases, till finally the abdomen becomes drum-like, the vomited matter, often fæculent in odour, becomes coffee-ground in character, the failing circulation is shown by coldness and lividity of the hands, and the patient, though so ill, may be unable from septic intoxication to appreciate at all the gravity of the situation. Before the abdomen has become tense and distended, the treatment is to remove the appendix, drain the pelvis, keep the patient sitting up, and introduce as much fluid into the colon as it will absorb. When the abdomen is tense and distended, the writer's practice is to delay operation and treat symptoms. For the vomiting, withhold all nourishment by the mouth, and wash out the stomach. To relieve pain, poultice the abdomen, and if needful give sufficient morphia. For distention, the frequent use of a flatus tube at times when the colon is not used for purposes of absorption.

The more chronic lesions of the appendix—those in which the inflammatory attack is liable to terminate in fibrosis—are more difficult of recognition than the acute varieties. There are good reasons for believing that anæmia, indigestion, and some forms of colitis have a relation to changes in the appendix, that they may be the chief evidence of these, and can only be cured by removal of that organ. In these instances the appendix should be palpable, and pressure on it should cause the characteristic uneasiness in some remote part of the abdomen of which the patient has made chief complaint. If these conditions are fulfilled, removal of the appendix should be advised, but it is never safe to promise, even after evidence of gross disease is found in the appendix, still less if a lesion has to be looked for with great care, that all the existing symptoms of ill health will disappear as a result of the operation. The fact is that in the abdomen as elsewhere, the results of speculative surgery are apt to lead to disappointment, and the brilliant cures occasionally effected do not always mean that the surgery has been good.

The " interval " operation for removal of the appendix is indicated (1) If there is a definite and reliable history of more than one attack of appendicitis ; (2) When physical signs of organic disease in the appendix are discoverable. A thickened, tender appendix can often be felt as a rounded, elongated body, pressure on which produces a disagreeable sensation in the neighbourhood of the umbilicus, the epigastrium, or the opposite iliac fossa. It should be unlikely that

the case is one for operation unless some physical sign of disease is present, and further waiting and watching are desirable before operation is decided upon.

Any other suggestions than these require the gravest consideration. It should not be taught that excision of the appendix does no harm if it does no good, and that every abdominal pain of doubtful origin demands exploration and, if no other explanation for it is found, removal of the appendix. Surgery in this haphazard way may do serious harm, but apart from this there are remote risks (adhesions, hernia) of operation which should be considered—the immediate risks are too small for consideration. The greatest disadvantage is that nervous but useful people are not infrequently converted into useless invalids, a trouble to themselves and a sorrow to their relations and friends, by a useless operation, and it is time to say that there are now too many victims of surgical activity in this field.

Keetley's novel suggestion[1] to preserve the appendix by converting it into an extra-abdominal viscus is sure to receive the consideration due to its author and to the excellent surgical principle that no part of the body which can be safely saved should be sacrificed. It has yet, however, to be proved that a diseased appendix can recover its functions and live a healthy life embedded in the abdominal wall.

G. R. Turner[2] gives the statistics brought forward by Treves in 1905 in a discussion before the Royal Medical and Chirurgical Society, when the aggregated results of five of the large London hospitals were produced. These showed that 1209 "interval" cases were operated upon with a mortality of ½ per cent, while of 1568 cases operated upon *during* an attack there was a mortality of 23·9 per cent. He mentions that in a number of the early operations the operators were less experienced than they are now, the cases were left longer, and the technique was not so safe or satisfactory. His own statistics show that out of a total of 190 acute cases operated upon he had a mortality of 10 per cent during the years 1894 to 1905, which was reduced to 6 per cent during the period 1905 to 1909. He has never refused to operate upon any case, however bad. He deprecates a waiting policy owing to its great danger, and thinks that an excess of examination by the latest scientific methods is only a waste of time. He has had cases of ruptured gastric and duodenal ulcers, of retroperitoneal hernia, of acute volvulus of the small intestine, and of ruptured ovarian cyst which have presented the symptoms and signs of appendicitis; a waiting policy in any of these cases would probably have been fatal. He contends that in the hands of a surgeon accustomed to abdominal work the operation is quite safe. In abscess cases he always removes the appendix where possible, only desisting when he considers that the search is endangering the patient's life.

James Phillips,[3] from the point of treatment, divides appendicitis roughly into three classes: (1) Mild cases, in which there is tenderness over McBurney's point, but neither a "lump" nor the muscular rigidity characteristic of acute peritonitis. The treatment he adopts

is " rest, starvation, and morphine." If the initial dose of morphia fails to relieve, the case is dealt with as under the third heading. (2) More severe cases, characterized by the presence of a definite, firm, more or less irregular " lump " in the right iliac fossa. He delays operation in such a case, giving as reasons the difficulty in reaching the lesion and danger of infecting the abdominal wound. By the rest and starvation treatment the " lump " is well on its way to dissolution by the end of a week in the great majority of cases. (3) Cases in which there is evidence of acute peritonitis and without the " lump " which indicates that the inflammation is well localized. Rigidity of the muscular segment of the rectus abdominis over the appendix is his indication for immediate operation, as he considers that this is probably the earliest sign of the presence of pus.

Unless there are grave contraindications, A. W. Cuff[4] always removes the appendix at the same time that the abscess is drained. He has had no experience in opening a pelvic abscess (secondary to appendicitis) per rectum or per vaginam, but considers that such treatment is dangerous. He thinks the abdominal route should be chosen for drainage in all cases. His paper is based on a series of 76 cases which were under his care during a period of three and a half years. Of these 68 had localized abscesses, while 8 had diffuse peritonitis, the mortality being 3 per cent for the former and 50 per cent for the latter. He gives an increasing pulse-rate as the most important indication for operation, and progressive abdominal rigidity next to this—the temperature is of slight importance as an aid to diagnosis. His incision is through the outer part of the right rectus sheath, enlarging this, if he finds it necessary, transversely or obliquely. He buries the stump and drains the abscess cavity with a tube containing a wick of gauze. Rectal saline injections are given as a routine after operation, and instead of propping the patient up in bed with a bed-rest, he always raises the end of the bed itself by means of wooden blocks.

John Allan[6] considers that relapsing and recurrent appendicitis constitute two distinct varieties, differing as regards symptoms, prognosis, and treatment. All cases of relapsing appendicitis should be operated upon, as the pathological process never settles down. In the recurrent variety the latter does subside ; therefore operation is contraindicated. In relapsing appendicitis the patient is never quite well after the acute attack ; there is persistent pain and tenderness in the right iliac fossa ; appendicectomy should be done. In the recurrent variety the patient recovers from the attack. The treatment in this case depends upon many things. It is surgical if the person is making a long sea trip, etc., or going to some place where medical aid could not easily be obtained, and it is surgical if the subsequent attacks are more severe than the preceding ones. Decreased severity of attacks indicate medical treatment. In the recurrent variety there are constantly recurring attacks of pain which would rather appear to be of the nature of a gastric condition. He is not convinced of the necessity for operation in every case : if the patient will lead a life

under proper hygienic conditions, there should be no necessity for operative interference.

In a discussion on the treatment of suppurative appendicitis, Sir George Beatson[6] stated that it is his habit to leave cases of appendicular abscess unopened for two or three weeks unless they point in the interval, when they are opened and drained. He is convinced that it is the non-observance of this treatment that is responsible for the heavy mortality in early operations for acute suppurative appendicitis. Diffuse suppurative appendicitis is much rarer than the localized form. In acute general peritonitis, irrigation, or wiping out the interior, of the abdomen is best left alone; rapid laparotomy with drainage is preferable. The patient should then be placed in the Fowler position, and large quantities of saline solution be introduced into the rectum. In localized appendicular inflammation the treatment is medical, and must effect prevention of peristalsis of the intestinal canal. During the nine years ending 1907, 1,007 cases of appendicitis were treated at the Glasgow Western Infirmary, 889 being cured and 118 dying, a mortality of 11·7 per cent. Of the 1007 cases the speaker was responsible for 147; of these 141 were cured and 6 died, a mortality of 6 per cent. The remaining 860 cases treated by his colleagues gave a mortality of 13 per cent. His indications for operation are (1) Diffuse suppurative peritonitis; (2) An abscess which is pointing externally; (3) During an interval between attacks when pulse, temperature, and blood-count are normal; (4) If the blood-count is high, operate only when satisfied that sufficient time has elapsed to give the opportunity for the formation of parietal adhesions and for the pus losing its virulence. Perforation and gangrene of the appendix do *not* call for immediate operation.

Mr. T. Kennedy Dalziel stated that when the suppuration is confined to the appendix its immediate excision is the only course. If an abscess is apparently localized, it is fairly safe to wait until adhesions have formed. The dangers of leaving an abscess are (1) General peritonitis; (2) Thrombo-pyelitis; (3) Septicæmia; and (4) The difficulty in such cases of removing the remains of the appendix. Dr. Donald MacPhail agreed with Sir Geo. Beatson in deprecating too much zeal and haste in operating on localized cases. During his twenty-seven years' work as a general practitioner he has had many cases of appendicitis to treat, and no case that he has had charge of from beginning to end has had to come under the surgeon's knife, and no case has died. Mr. Maylard stated that in a series of 127 cases of appendix abscess from his hospital wards, 49 cases merely had the abscess opened and drained, there being a mortality of 10·2 per cent. Of the remaining 78 cases the appendix was also removed, and there was a mortality of 29·5 per cent. He strongly advocates early operation in acute appendicitis. Dr. Knox, during the last three years, had operated upon 105 cases of appendicitis with 5 deaths. In most of them there was pus, and in several general peritonitis.

Statistics from the Berlin hospitals for 1907[7] show two points clearly:

(1) That the earlier the operation in emergency cases of appendicitis the better is the prognosis; and (2) That in late operations on such cases the mortality in 1907 is lower than in 1906 (possibly owing to more skilful after-treatment ?).

Charles A. Morton[8] records ten cases where, a few hours after the anæsthetic vomiting (if any) had ceased, the patient (almost always a child) suddenly collapsed and died in a few hours. The symptoms are similar to those of chloroform poisoning. He suggests that they may be produced by the absorption of a septic toxin, present before operation, but not absorbed until a raw surface was produced by the operation wound.

Bilton Pollard[9] arranges pelvic abscesses in connection with appendicitis in two groups: (1) Where abscesses form independently in the right iliac fossa and in the pelvic cavity; (2) Where there is a pelvic abscess only. In the first group the iliac fossa abscess should be drained by the abdominal route, the line of the incision being the left linea semilunaris. When the abscess is deeply situated, he always opens it into the rectum, whether male or female, preferring this route in the latter to vaginal drainage. He considers it inadvisable to allow these abscesses to point and burst spontaneously. He quotes two cases where he opened a pelvic abscess into the rectum; both made a good recovery.

Murat Willis[10] obtained answers from 105 American operating surgeons to the following questions: (1) Do you crush or ligate stump ? (2) Do you divide with knife or cautery ? (3) Do you use any chemical in disinfecting ? (4) Do you bury the stump ? (*a*) If so, how ? (*b*) If not, why not ? (5) Have you observed any difference in the intensity or character of pain between cases when the stump is buried or unburied ? (6) Have you seen any ill effects arise from unburied stumps, if so, what ? (7) Have you observed any harmful effects of any character from burying the stump ? Post-operative pain is one of the arguments advanced by the exponents of the unburied stump; but Lennander's work proving the absence of sensory nerves in the visceral peritoneum invalidates this assumption. Infection and abscess occurred in two cases after the stump was buried. Adhesions following burying of the stump were not reported in a single reply. That adhesions do occur when the stump is left unburied was proved by the number of cases of intestinal obstruction following this detail in the operation of appendicectomy. The chief objections to leaving the stump unburied appear in nearly one-fourth of the 105 replies. They are: (1) Obstruction to the bowel; (2) Slipped ligature, with escape of fæcal contents into the abdominal cavity; (3) Adhesions of the raw surface of the stump to omentum, abdominal wall, and various neighbouring viscera.

The inability to secure the appendix during an operation for acute appendicitis is, C. G. Levison[11] thinks, largely due to lack of care in determining its position prior to operation. By extending the incision into the lumbar region there is a better chance of finding the appendix,

especially when this is in a retrocæcal position. He quotes a case of cholelithiasis which was diagnosed as a retrocæcal appendix abscess; at the operation a distended gall-bladder presented.

J. W. Churchman[12] gives statistics showing that appendicitis in childhood is a very frequent disease, but that infantile appendicitis is rare.

REFERENCES.—[1]*Lancet*, Jan. 2, 1909; [2]*Ibid.* July 24, 1909; [3]*Ibid.* Oct. 17, 1908; [4]*Ibid.* Aug. 8, 1908; [5]*Pract.* Mar. 1909; [6]*Glasg. Med. Jour.* June, 1909; [7]Roths, *Berl. klin. Woch.* July 12, 1909; [8]*Lancet*, May 22, 1909; [9]*Brit. Med. Jour.* July 25, 1908; [10]*Ann. Surg.* July, 1908; [11]*Jour. Amer. Med. Assoc.* Nov. 28, 1908; [12]*Johns Hop. Hosp. Bull.* Feb. 1909.

APPENDICITIS, ACUTE. (*See also article* BLOOD.)

Robt. Hutchison, M.D.

Discussing the question whether aperients or sedatives should be administered in the early stage of acute appendicitis, Maylard[1] decides that one should at once give $\frac{1}{6}$ gr. **Morphia** hypodermically simply for the relief of pain, and begin immediately the administration of drachm doses of **Sulphate of Magnesia** every hour until the bowels open. He prefers hot applications to an ice-bag locally.

REFERENCE.—[1]*Pract.* May, 1909.

APPENDICOSTOMY. *Rutherford Morison, F.R.C.S.*

The classification of colitis Dawson[1] approves of is: (1) Simple acute; (2) Simple chronic; (3) Ulcerative acute; (4) Ulcerative chronic. In the treatment of (1) he disapproves of a milk diet, as the residue forms small, hard globular fæcal masses which are extremely irritative. For the remaining three subdivisions an appendicostomy gives good results. He discusses the use of appendicostomy for chronic constipation, drainage of the cæcum, and relief of abdominal distention, and to permit of direct medication of the lower ileum. He quotes twenty cases where the operation has been performed for the various conditions. Small complications in the operation he has seen are: (1) Stitch abscess where the appendix was opened on the operation-table. (2) A catheter slipped into the cæcum, but was soon passed per rectum. (3) Signs of boracic acid poisoning in one case, but the substitution of sterile water as an irrigating medium for boracic acid solution quickly brought about a cure.

W. Billington[2] claims that appendicostomy is very valuable in general peritonitis in order to introduce the large amount of fluid required into the circulation. He uses normal saline solution, and not more than 1 pint per hour. When absorption ceases, as much fluid is evacuated from the rectum as is introduced into the cæcum, and the supply is then cut off. At the end of forty-eight hours the opening in the appendix is sutured up. Good results have followed in cases treated by this method.

At the operation for appendicostomy Keetley[3] finds the appendix through a small incision, and brings the tip to the surface through a separate button-hole puncture of the skin. Care must be taken to

avoid trauma to the organ or interference with its blood-supply. He does not open the appendix for forty-eight hours after the operation, and if the operation is only a temporary measure the tip is cut off flush with the skin; if, however, the fistula is to be permanent, he removes the sero-muscular coat only and doubles over the excess of mucous membrane like a coat sleeve, thus making a neat little nipple. He thinks that appendicostomy is the best operative measure devised for chronic constipation, for it has never failed him yet. As to whether it is necessary for the patient to irrigate the bowel daily *via* the appendix for the rest of his or her life, it is not possible to say, as it is only four years since this operation was first performed for chronic constipation. The operation is of great value in intussusception, for it anchors the cæcum to the parietes, preventing a recurrence; it permits immediate hot lavage of the intestine, which is inflamed and bruised, and it checks hæmorrhage, and washes away clots and decomposed fæces and mucus. A series of 36 cases are briefly reported where appendicostomy, transplantation of the appendix, and cæcostomy was done.

The difficulties arising in this operation are the accidental ligature of the meso-appendix leading to sloughing of the tip of the organ, kinking of the appendix, making its approximation to the belly wall very difficult, and a tendency to stenosis if the mucous membrane is not secured when the tip is amputated.

REFERENCES.—[1]*Brit. Med. Jour.* Jan. 9, 1909; [2]*Ibid.*; [3]*Lancet*, Jan. 2, 1909.

ARTERIES, DISEASES OF. *Carey F. Coombs, M.D., M.R.C.P.*

Arteriosclerosis.—ETIOLOGY.—Clifford Allbutt[1] divides arteriosclerotics into three groups, according to the origin of their vascular degeneration. In the first group are those cases which are toxic in origin; the second consists of those associated with high arterial tension, not by any means always renal in origin, but possibly due sometimes to intestinal toxæmia; while the third or "decrescent" type is that of old age, purely degenerative. In the second or "hyperpietic" group, there is a struggle between the heart and the high tension of the peripheral arteries, which may end in cerebral hæmorrhage or in cardiac defeat; while in cases of the decrescent type the chief danger is thrombosis of the cerebral arteries.

SYMPTOMS.—The effects of sclerosis of the arteries are—at first at any rate—paroxysmal, the symptoms being motor in some instances, in others sensory, in others both motor and sensory. Thus Wandel[2] describes the paroxysmal symptoms referable to sclerosis of the arteries of the limbs in persons after middle life. In men the legs are oftener affected, in women the arms. The motor symptoms consist in attacks of temporary loss of power, and the sensory symptoms in various transient paræsthesiæ, more often found on the ulnar side of the forearm. Ortner[3] has described cases of intestinal colic associated with subjective and objective abdominal distention, in whom sclerotic changes were found at autopsy in the mesenteric vessels. Somewhat

similar attacks are alluded to by Gilbride[4] and Akin ;[5] these were, however, apparently gastric rather than intestinal, the principal features being epigastric pain, a sense of distention with cardiac embarrassment, and flatulence. Goldscheider[6] alludes to headaches of a similar type, and to other pains of variable distribution, to be ascribed to sclerosis of arteries supplying the spinal cord, muscles, or the peripheral nerves. The truth appears to be that arteriosclerosis means inefficient nutrition of the tissues owing to imperfect carriage of their blood-supply ; this inefficiency is at first such that it is not manifested while the tissue is at its normal rate of work and at rest, and is only apparent when special tasks call for a specially free supply of blood. Then there occur temporary failures in the functioning of muscles and nerves, leading to the phenomena alluded to above. (Compare also Sachs's paper[16] referred to below.)

Treatment.—There is a suspiciously large series of alternative plans of treatment. **Hydrotherapy** is recommended by Sadger[7] and Martinet.[8] Gouget[9] advocates a **Diet** consisting of bread in small quantity, meat and fresh fish, well cooked, either hot or cold, but without jelly ; eggs, milk, fresh vegetables and fruits. The bulk of solids and fluids ingested must be small. The evening meal must be a light one without meat. Loeper and Gourand[10] recommend a diet deficient in lime salts, the details of which are given fully in an English journal ;[11] with theobromine, digitalis, sodium bicarbonate, and iodides, to promote excretion of calcium. Scheffler,[12] of St. Etienne, presupposing in arteriosclerosis a general demineralization of the tissues, treats his arteriosclerotic patients with **Sodium Silicate** internally. It is a syrupy liquid without toxic effects, but the taste is unpleasant. He prescribes silicate of soda 1 oz., water 18 oz. ; two or three tablespoonfuls daily in milk, water, or wine. Writers agree, however, in the value of **Iodine** compounds. Wiesel,[13] Erlenmayer and Stein[14] speak well of the newer synthetic substances such as **Iodipin** and **Saiodin ;** while Gouget[9] recommends **Potassium Iodide** in doses of 3 to 7 gr. thrice daily (more, and with mercury, in syphilitic cases), after food, with an alkali, in plenty of water. Spitzley[15] records a case in which potassium iodide was of service. **Theobromine** is recommended by Wiesel,[13] and Goldscheider[6] mentions it with the nitrites as exercising a vasodilator action useful in the relief of arteriosclerotic pains.

Thrombo-angiitis Obliterans.—Sachs[16] speaks of the impossibility of drawing a sharp line between the phenomena of Raynaud's disease and those of erythromelalgia, and states that both conditions may mark the onset of arterial disease sufficiently definite to lead eventually to dry gangrene of the limb concerned. Sometimes they may be associated with intermittent limp, a paroxysmal weakness of the limbs induced by exertion and referable also to arterial disease. Buerger[17] applies these remarks more especially to a disease which he names " thrombo-angiitis obliterans," generally spoken of in England as " endarteritis obliterans." In another paper[18] he discusses surgical

treatment. The patients are Polish and Russian Jews from twenty to forty. The lower limbs only are affected. The symptoms occur in three stages. In the first, there are pains on exertion, cramps, numbness, and cold feet. In the second there are trophic changes, with severer pain, and the toes, if hanging down are bright red; if the limb be raised they become blanched. The pulse cannot be felt in the dorsalis pedis artery. In the third stage there is gangrene. The pathological changes have been thoroughly investigated by Buerger. The larger arteries and veins are obliterated by red clot, which becomes organized and canalized. This concerns sharply limited tracts, usually in the anterior and posterior tibial vessels, and does not extend into the smaller arteries. There is no intimal proliferation, but some secondary changes may occur in the media of the arteries. In the adventitia a fibroblastic inflammation is often seen extending to and enwrapping veins as well as arteries, sometimes nerves also. The *exciting cause* is quite unknown.

TREATMENT.—Drugs, electricity and physical methods are alike useless. Buerger expects amelioration from **Arteriovenous Anastomosis** between the femoral artery and vein, and gives an elaborate list of indications for the operation; but in view of the migratory character and uncertain distribution of the disorder, the outlook does not seem rosy.

REFERENCES.—[1]*Hosp.* July 24, 1909; [2]*Münch. med. Woch.* Nov. 3, 1908; [3]*Samml. klin. Vortrag.* No. 347; [4]*Jour. Amer. Med. Assoc.* Mar. 20, 1909; [5]*Ibid.* June 5, 1909; [6]*Ther. d. Gegenw.* May, 1909; [7]*Ibid.* Nov. 1908; [8]*Presse Méd.* 1908, No. 104; [9]*Jour. Méd. de Brux.* Sept. 3, 1908, in *Brit. Med. Jour.* Oct. 17, 1908; [10]*Presse Méd.* 1908, No. 89; [11]*Med. Press*, Sept. 1909; [12]*Ibid.* Sept. 30, 1908; [13]*Wien. klin Woch.* 1909, Nos. 12 and 13; [14]*Ther. Monats.* 1909, No. 3; [15]*Brit. Med. Jour.* Oct. 3, 1908; [16]*Amer. Jour. Med. Sci.* Oct. 1908; [17]*Ibid.*; [18]*Jour. Amer. Med. Assoc.* Apr. 24, 1909.

ARTHRITIS DEFORMANS. *Robt. Hutchison, M.D.*

The belief is gaining ground that arthritis deformans or rheumatoid arthritis is the result of a chronic toxæmia which is produced by some error in metabolism or by absorption from some mucous surface. Various classifications of the different types of the disease continue to be put forward, but little would be gained by attempting to summarize these, as they are all essentially tentative in their nature. Most authors, however, are agreed that two main varieties can be recognized: (1) An atrophic form in which there is no overgrowth of the ends of the bones (rheumatoid arthritis), and (2) A hypertrophic form in which the changes begin in the bone, and destruction of it is combined with new formation and overgrowth (osteo-arthritis).

Tubby[1] deals with the subject of treatment in these two varieties as follows:—

In the *Hypertrophic* or *Osteo-arthritic* form, particularly of the senile variety, the general health of the patient is to be maintained, and he should live on a dry soil. In the winter a change to a warmer climate is recommended, and at other times visits to watering-places, such as

Aix, Buxton, Bath, Droitwich, or Woodhall Spa, with appropriate baths, douchings, or shampooings, often cause some alleviation. Care should be taken that the diet is plentiful and nutritious, but any excess of nitrogenous extractives or carbohydrates is to be avoided. Locally, the joint should not be kept at rest, but the patient must use it within the limits of fatigue. Massage and electricity are useful.

The Atrophic Form (*Rheumatoid Arthritis*).—In a patient who is threatened with this disorder, especially if he is young, the treatment should be very much on the lines of that employed in early phthisis. The anæmia should be combated with **Iron** and **Cod-liver Oil,** a special diet should be ordered, the patient should have plenty of **Rest** and **Fresh Air,** and a sea voyage is useful. When the disease has fully declared itself, treatment is both constitutional and local.

TREATMENT.—*Constitutional.* The first essential is that the patients have plenty of rest. They should go to bed early, and as a rule be in bed ten hours out of the twenty-four. All fatigue, worry, and overstrain must be minimized, and plenty of sunshine, fresh air, and exercise short of weariness are indicated. Under no circumstances should the patient be depleted or the parts leeched; in fact, every possible cause of exhaustion or weakness is to be avoided.

Diet.—**Fermented Milk** is useful, particularly if there be intestinal putrefaction, as manifested by offensive alkaline stools and the presence of an excess of indican in the urine. Carbohydrates and meat should be partaken of sparingly, and alcohol is best avoided altogether.

Drug Treatment.—Constipation is best treated by some laxative water. **Guaiacol Carbonate** is useful in the acute stages, probably because it limits intestinal putrefaction. In the chronic stages **Arsenic** and **Iron** or **Donovan's Solution** are useful as tonics. Cod-liver oil is of service if it can be tolerated.

Local Treatment.—Under no circumstances is the joint to be fixed; support rather than fixation is called for. If the part is tender and painful it should be compressed by layers of cotton-wool and an elastic bandage; but these must be taken off at least once in twenty-four hours to allow the joint to be used as freely as the condition permits.

Cataphoresis.—Some medicaments may be introduced into the tissues by cataphoresis. The best is **Iodine** in the form of linimentum iodi. The part is painted with the liniment, and a constant current of 10 ma. is applied to the joint for from ten to fifteen minutes. The effects, so far as diminishing the stiffness and the limitation of the joint, have been encouraging.

Physical Therapeutics.—**Radiant Heat, Vibration,** and **Hot-air Baths** have a very definite place in the treatment. A method which is recommended is that of the hot-air bath, or, better still, radiant heat from electric lamps. From fifteen to thirty 16-candle power incandescent lamps are so arranged that the patient, entirely nude, reclines on a couch with the head outside the cabinet. The lights are so controlled that the entire field may be graduated from a slight glow to the maximum of intensity. The patient's head is kept cool and free from

congestion by an ice-cap or electric fan. The duration of the bath is at first from ten to fifteen minutes, and later from thirty to thirty-five minutes. In ten minutes profuse sweating occurs, which must not be allowed to be excessive. Afterwards a cold sponge-bath is used, followed by a good rub down, and succeeded by vibratory massage for a few minutes. The result is one of general stimulation, and the dyspeptic symptoms disappear. Then the joints diminish in size, and stiffness and pain pass away. In place of vibration, skilled massage is frequently employed. These physical methods are useful adjuncts to dietetic measures.

Surgical Measures.—In the hypertrophic (osteo-arthritic) form these are of little value. **Injections of Sterilized Vaseline** have been employed by Buedinger, who injects from 1 to 4 cc. into the knee, and less for smaller joints. He states that the pain and reaction last for from two to six days, but that improvement follows so far as increased freedom of movement is concerned.

The question of forcible movement in this condition may be entertained, but certainly only those cases where serious interference with locomotion has occurred should be attacked, and then the efforts under an anæsthetic must be purely tentative and the effects watched. Any increase in inflammatory symptoms negatives further attempts. In hypertrophic arthritis it is very seldom necessary to aspirate the joint, because the synovial fluid is rarely in excess; nor is incision called for, because the synovial fringes are not hypertrophied.

Where X-ray examination reveals the presence of a spur interfering with the motility of the joint its removal may be of use. Loose bodies in the knee-joint may call for arthrotomy. Excision of the hip for malum coxæ senilis has yielded poor results. (Robert Jones[2] treats such cases in the early stage by prolonged rest in bed and fixation of the joint by a splint.) In the atrophic form aspiration of the joint is very useful in those forms in which fluid is very rapidly formed and the joint much distended. It gives immediate relief.

Care should be taken not to allow *deformities* to arise during treatment. If they have already formed, operative measures may be called for. Before, however, operations on the joints are undertaken, the contraction in the soft parts must be overcome by section of the muscles, tendons, and fasciæ on the flexor aspects. Again, by the correction of deformity, movement may be secured which has been lost during the active stage of an arthritis. But in advanced atrophic arthritis a large degree of restoration of movement must not be expected, because the cartilages are so frequently eroded. Especially in this form of the disease is a word of caution needed as to forcible movements under anæsthetics. The bones are atrophied, thin, and excessively brittle, so that a fracture is readily caused, and therefore it is better to correct the malposition gradually by mechanical means.

In all these surgical procedures the after-treatment is of just as much importance as the operation. The secret of success is early and gentle manipulations. They should be sufficient to secure slight

increase in the movement after each manipulation without any further access of inflammation ; and when the patient can voluntarily carry out what passive manipulation has gained from time to time, then active movements should be commenced. Frequently it is necessary to protect the joint by an apparatus so adjusted as to permit of a few degrees less movement than that of which the joint is actually capable. At this stage the advantage of physical therapeutics is considerable for the absorption of exudation, for improving muscular tone, and increasing local nutrition.

Robert Jones[2] also deals with the surgical treatment of the rheumatoid group of joint affections, but his paper does not admit of being summarized.

Booth[3] reports a case of arthritis deformans in a woman of twenty-nine, in which great benefit seemed to result from high **Irrigation of the Bowel** with three quarts of warm water containing two tablespoonfuls of Epsom salts. The motions were at first extremely offensive, but afterwards became normal, and the whole of the symptoms greatly improved.

Bailey[4] speaks highly of the benefits of **Radiant Heat combined with Cataphoresis.** The joint is exposed to the action of the radiant heat for twenty minutes, and directly the sitting terminates cataphoresis with iodine ions is carried out. He attaches great importance to continuing the administration of **Iodides** or salts of **Guaiacol** by the mouth also.

Somerville's[5] method of carrying out **Cataphoresis** is to surround the joint affected with a large pad of lint of ten layers in thickness soaked in the particular solution, and to place round this pad a metal gauze electrode tightly bound to the limb and connected with the negative pole. By this means salicylic acid is introduced when a solution of sodium salicylate is employed ; iodine when potassium iodide is used, and chlorine when sodium chloride is applied. The positive electrode, laid on a large pad of lint soaked in an ordinary salt solution, may be placed on another part of the body. He can speak from personal experience of the value of this treatment in reducing swelling, alleviating pain, and lessening rigidity of the tendons in cases of rheumatoid arthritis.

REFERENCES.—[1]*Lancet*, Dec. 26, 1908 ; [2]*Brit. Med. Jour.* July 3, 1909 ; [3]*Lancet*, Dec. 19, 1908 ; [4]*Brit. Med. Jour.* Jan. 2, 1909 ; [5]*Ibid.* May 8, 1909.

ASTHMA. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

The papers and discussions on asthma throughout the year show that a wide diversity of opinion still prevails as to the causation of the condition seen during a paroxysm. The observations and arguments are too complicated for summary, but it may be said that of the two views of the cause of the obstruction of the tubes—hyperæmia of the vessels or spasm of the muscles—the latter tends to prevail, probably as a result of the experiments of Brodie and Dixon. As is well known, constriction of the tubes can be produced by stimulation of sensitive

areas on the nasal mucosa, suggesting the efficacy of nasal treatment. What factor lies at the back of the irritability; whether a neurosis or—as seems more probable and is upheld by A. G. Auld[1] in an exhaustive article—a toxæmia, with which such symptoms as the eosinophilia and the occasional urticaria fit in well—is as yet undecided.

N. Lloyd[2] well sums up the conditions necessary to produce an attack of asthma, as threefold: a constitutional peculiarity, specially hypersensitive areas, and an irritant. These hypersensitive areas are to be found most commonly in the nose, or in the alimentary canal.

Treatment naturally falls into two divisions: the relief of the acute attack, and its prevention, i.e., treatment between the attacks. The power of morphia to cut short the acute attack is well known, but its use in a chronic complaint is to be deprecated, except in attacks of the utmost severity when other means of relief have failed. Local treatment, by sprays containing **Cocaine** and **Atropine,** may take the place of morphia, especially when applied to the nasal mucosa, but is open to the same objection, though to a less degree. Such a formula as Einhorn's (see last year's *Medical Annual*) is undoubtedly very efficacious.

Of general remedies, two have received strong support as giving immediate relief: **Atropine** (G. Treupel,[3] E. I. Spriggs[4]) gr. $\frac{1}{100}$ hypodermically, and **Adrenalin** (Jagié[5]) 0·5 ccm. of 1–1000 solution hypodermically, first introduced by Solis Cohen.

From the details of Jagié's cases, it appears that it has the power of cutting short the most severe attacks in a few minutes. In one of the quoted cases the dose given was increased to 1 ccm. Though so efficacious in the paroxysm, it has no power of prevention. Other remedies that may be applied at the moment are **Nitrite of Amyl** and **Iodide of Ethyl** (S. West[6]), or inhalations of **Chloroform,** in addition to the usual powders. All writers speak in favour of strong black **Coffee.**

Boellke[7] has found **Pyrenol** (benzoyl-thymol-sodium oxybenzoate) of great service in less acute cases, in doses of 3 to 4 grams per diem. Under its use dyspnœa was relieved in three or four days, and the expectoration generally became looser on the second day. No harmful effects followed its continued use.

In the intervals between the attacks, **Potassium Iodide** and **Stramonium** (the extract rather than the tincture: R. C. B. Wall[8]), the latter pushed till slight physiological symptoms results, with arsenic, forms perhaps the most useful combination; or potass. iodide with potass. bromide (West[6]). Auld[1] speaks well of **Balsam of Peru** in combination with potass. iodide or, in the old and emaciated, with ol. morrhuæ. The last-named author lays stress on a special anæmia often to be observed, the treatment of which by **Iron** and **Arsenic** is necessary, and gives good results. The nose should be carefully examined. Wall quotes twenty-three cases in which some abnormality was found; treatment gave relief in fourteen cases, but in none a complete cure.

The frequency of a gastric origin indicates special attention to diet; there is no need, however, for being too precise, the directions of Cullen being sufficient (Auld[1]), i.e., no large meal, no food slow of digestion, no flatulent vegetables, no alcohol. Light animal food in moderate quantity is well borne. All authorities are agreed on the inadvisability of making a heavy meal late in the day—certainly not later than 5 p.m., and better at mid-day.

Gymnastic and **Respiratory Exercises,** hill-climbing, cycling (Marcet), swimming (Auld) are all of value in prevention.

Carmalt Jones[9] claims to have isolated a micro-organism which he believes to be the cause of certain cases of asthma, and has seen benefit follow treatment by a vaccine.

REFERENCES.—[1]*Brit. Med. Jour.* Dec. 26, 1908; [2]*Ibid.* Jan. 16, 1909; [3]*Deut. med. Woch.* Dec. 31, 1908, in *Brit. Med. Jour.* Mar. 13, 1909; [4]Roy. Soc. Med. *Lancet,* Mar. 20, 1909; [5]*Berl. klin. Woch.* Mar. 29, 1909; [6]*Clin. Jour.* Aug. 11, 1909; [7]*Med. Klin.* Feb. 21, 1909, in *Brit. Med. Jour.* Apr. 17, 1909; [8]Roy. Soc. Med. *Lancet,* Mar. 20, 1909; [9]*Ibid.*

BANTI'S DISEASE. *George Lovell Gulland, M.D.*

A. Zancan[1] describes a case of Banti's disease. The patient was a woman of 27, in poor condition, anæmic, with a leucocyte count of 3,200, considerable enlargement of the liver, and very great enlargement of the spleen. Treatment by iron and arsenic for a month and a half had no effect, and the spleen was therefore removed. The patient stood the operation well, and recovered completely. She was seen two years afterwards, and was in the best of health; she had put on a stone and a half of weight. The liver had shrunk to the normal size. [Many cases have now been reported in which **Splenectomy** has cured the disease permanently. (Cf. *Medical Annual,* 1909, page 158.) In a case recently under my care, operation was refused, and the patient made an excellent recovery under X-ray treatment applied to the spleen. The blood returned to the normal, the spleen diminished in size so that it was no longer palpable, and the patient left hospital in excellent health.—G. L. G.]

REFERENCE.—[1]*Il Policl.* Jan. 1909.

BERI-BERI. *J. W. W. Stephens, M.D.*

Fraser and Stanton[1] record experiments made by them at Kuala Lumpur, Federated Malay States, as to the relationship of rice to beri-beri. *White rice*: In this case the padi (unhusked rice) has not been boiled, but it is milled by machinery, and the husk, pericarp, and surface layers of the seed removed. This is "the stale uncured rice" of Braddon. *Parboiled rice*: The rice, after soaking, is steamed for from five to ten minutes and subsequently dried in the sun. This is the "cured" rice of Braddon. It is now stored unhusked or milled at once. The authors now carried out observations on 300 Javanese engaged in road construction, the investigation being so arranged that one set consumed "white rice," the other "parboiled rice." The result was that 20 cases of beri-beri occurred among 220 people on

white rice. No case occurred among 273 people on parboiled rice, and under similar conditions to those which obtained in the white rice parties at the time beri-beri was prevalent among them. No case occurred in any coolie who had been on white rice for a less period than eighty-seven days. In three cases where outbreaks occurred among parties on white rice, substitution of parboiled rice was followed by a cessation of the outbreak.

C. N. Saldanha[2] states dogmatically that beri-beri is due to a fungoid disease of paddy, i.e., rice with the husk not removed. The active principle of the fungus is arsin (*arsi* is Tamil for rice). In curing (boiling) rice, the arsin is rendered inert. But no proof is given of any of these statements.

T. K. Monro[3] records a case of beri-beri peculiar for the facts (1) that it occurred in a Scandinavian patient while sailing off the shores of Great Britain, and (2) for the presence of an erythematous eruption on the face, neck, arms, and legs.

REFERENCES.—[1]*Lancet*, Feb. 13, 1909; [2]*Brit. Med. Jour.* Nov. 28, 1908; [3]*Lancet*, Feb. 20, 1909.

BILHARZIA. (*See* SCHISTOSOMIASIS.)

BLACKWATER FEVER. *J. W. W. Stephens, M.D.*

A. Celli[1] strongly recommends **Quinine Tannate** in the form of chocolate pastilles in cases where there is intolerance of those quinine salts which are soluble in water.

Skelton,[2] after discussing the etiology, describes his method of treatment: (1) The rectum is washed out by a simple soap-and-water enema; (2) The following mixture is then slowly siphoned into the rectum: quinine sulphate, 50 gr.; dilute hydrochloric acid, q.s.; warm water 3 oz. (how much quinine is actually absorbed in this way is not known). The quinine is repeated after twenty-four hours. The author has made a trial of the liquid extract of cassia bereana, and concludes that he "has never seen it do any good," as might have been expected. He treats vomiting by injection of morphine, $\frac{1}{3}$ gr., repeated after six hours. He also applies hot fomentations to the stomachic area. Suppression is treated by a combination of the hot-air bath, 1 min. of croton oil, and the infusion of 4 pints of saline solution.

C. A. Bentley and S. R. Christophers,[3] assuming the malarial origin of blackwater fever, attempt to explain the mechanism of the production of the blackwater. They first ask the question, Why is not hæmoglobinuria seen in severe malaria? The answer they give is the following. Because red cells are phagocyted in the spleen, a phenomenon the authors call erythrokatalysis, and this active reaction is characteristic of malignant tertian infections, but not of quartan or of simple tertian. The production of the hæmoglobinæmia and hæmoglobinuria in blackwater, they represent as analogous to the effects produced in animals by a hæmolytic foreign serum. Thus, by injecting a goat with dog's blood, the goat's serum eventually becomes strongly

hæmolytic for dog's corpuscles (i.e., contains *hæmolysin*). On injecting the goat's serum into dogs two effects may be obtained: (1) Erythrokatalysis on a huge scale in the spleen; or (2) By varying the dose, erythrokatalysis as before, but on a smaller scale, and after twenty-four hours a new phenomenon, hæmoglobinæmia, hæmoglobinuria, and the yellow staining of the tissues as in blackwater. This phenomenon the authors call lysæmia. How is lysæmia produced in blackwater? They answer the question by supposing that an animal can in its own body produce a serum (immunizing) which will hæmolyse its own corpuscles, i.e., an autolysin. They further consider that the conditions of infection under which blackwater occurs result in repeated and persistent blood destruction and resorption, and the formation of an autolysin.

J. O. W. Barratt and W. Yorke[4] contribute an elaborate investigation into the mechanism of production of blackwater. They start from the assumption that blackwater fever is malarial in its origin, and they seek to explain how quinine can produce hæmolysis. Quinine, they show, cannot have this result in consequence of any direct hæmolytic action on the red cells, as a dose in itself toxic would be necessary in order to bring about the phenomenon. Neither are the red cells more susceptible to the action of quinine in blackwater fever than in health. The second result they arrive at is that blackwater, unlike paroxysmal hæmoglobinuria, is not due to a hæmolysin. Thirdly, they consider the question whether the hæmoglobinuria is due to a preceding hæmoglobinæmia. They first establish that hæmoglobinæmia produced experimentally in a rabbit is followed by hæmoglobinuria, but point out that the amount of hæmoglobin in the blood plasma in cases of blackwater—while the urine still contained hæmoglobin—is usually, but not always, greater than that obtained from the plasma of healthy individuals, so that on this ground no very definite conclusion can be reached.

One of the most interesting sections is that dealing with the mechanism of suppression in blackwater fever. The authors reach the conclusion that suppression is entirely due to mechanical causes. In the rabbit, hæmoglobinuria leads to granular casts in the urine; and in blackwater fever also, large firm casts with exceedingly coarse granules, often surrounded by epithelium from the ducts of Bertini, are present. The urine passed during suppression contains a large amount of coagulable proteid. Examples of these casts are given in *Plates XXVI, XXVII.* The casts may vary in size from 15 to 200 μ, or more; their diameter ranging between 3 μ and 25 μ, or more. If the granules in the casts are scant, the hyaline matrix is visible. The granules vary in size from 0·5 to 4·0 μ. The casts are brown in colour, and are either hard and dry, or soft and swollen (*Plate XXVII, Fig. D*). Hyaline casts are less frequent. Casts containing nuclei and epithelial casts, are not uncommon. Free cells derived from the tubules also occur. Red blood-cells were met with in ten out of twenty cases; occasionally squamous epithelium, pus, and bacilli. These were the only cellular

PLATE XXVI

URINARY DEPOSITS IN BLACKWATER FEVER

After Barratt and Yorke (*Annals of Tropical Medicine and Parasitology*, Vol. iii. No. 1)

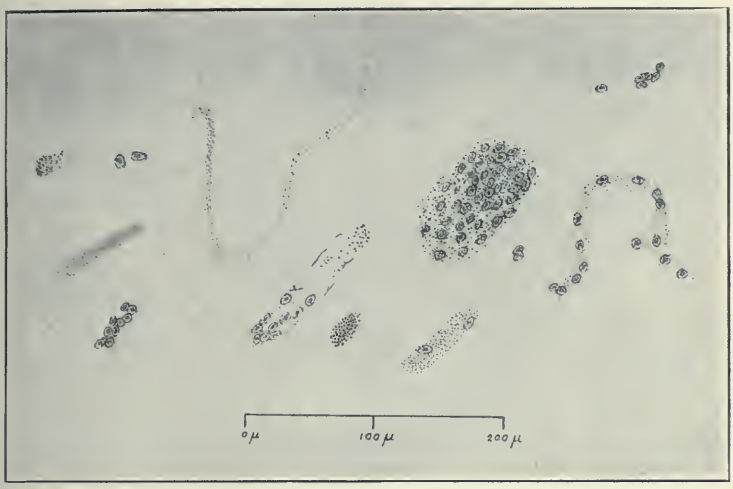

Fig. A.—Granular and epithelial casts in urine of rabbit twelve and a half hours after intravenous injection of dissolved hæmoglobin. × 180

Fig. B.—Deposit from porter-coloured urine. Granular casts and free granules are seen. Also one hyaline cast. Nuclei can be recognized in four of the casts. × 180

URINARY DEPOSITS IN BLACKWATER FEVER—*continued*

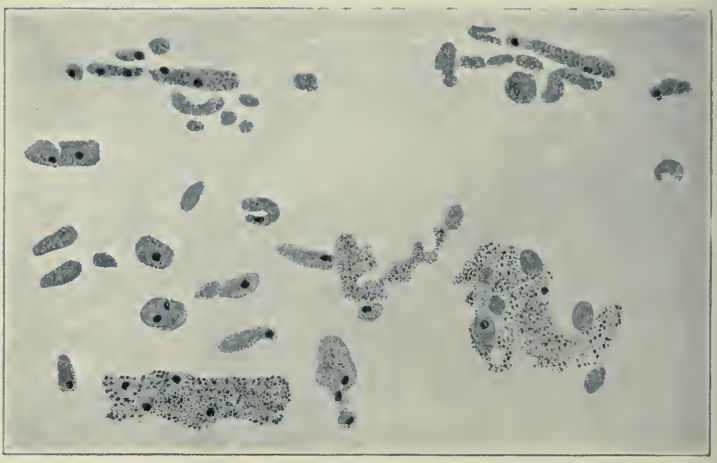

Fig. C.—Deposit from porter-coloured urine stained with a watery solution of methylene blue. The deposit consists of granular casts and masses, in some of which nuclei of renal origin are seen. The granules are mostly fine, but some coarse granules are seen. A few renal cells are also present. × 180

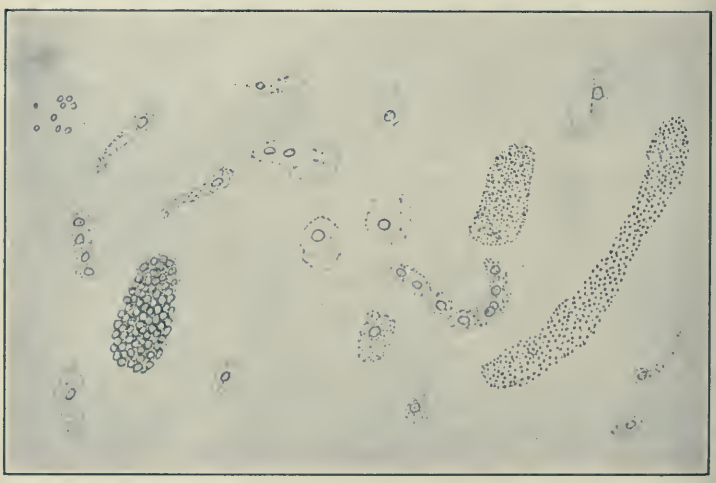

Fig. D.—Deposit from porter-coloured urine, consisting of numerous epithelial casts and a few red blood-cells, the latter being shown in the upper left hand corner. × 180

elements seen. When suppression (oliguria) exists, casts are still found in the urine. The casts are dark and granular and large, 100 to 150 μ by 40 to 60 μ, and with coarse granules, 5 μ in diameter, of a dark reddish-brown colour. They are covered with epithelium derived from the ducts of Bertini, which the casts had completely blocked. The daily amount of urine passed in two cases of oliguria varied from 11 to 43 cc. in one case and from 8 to 92 cc. in the other. The urine was pale yellow and of very low specific gravity, 1010 to 1015 in one case and 1008 to 1009 in the other. The coagulable proteid present, estimated by acidifying and boiling, measured on standing, from $\frac{1}{4}$ to $\frac{2}{3}$ of a column of the urine.

The changes found in the kidney post mortem, in a case with suppression of urine, were the following. The kidneys were markedly enlarged. The cortex could not be sharply differentiated from the medulla. The latter was dark brown or almost black in colour, due to a radial striation visible to the naked eye, and also due to a certain amount of cortical stippling. Microscopically the ducts of Bertini showed reddish-brown granular plugs 40 to 80 μ in diameter, similar to those in the urine, and giving rise to the above-mentioned striation. The size of the granules forming these plugs was 3 to 5 μ. The plugs also contained epithelial cells and finer granules. The tubules were distended to 40 to 50 μ in diameter, the epithelial lining being flattened; but there was no cloudy swelling. These findings have a practical importance, in that suppression may be suspected when the casts in the urine are large and very firm; also there arises the question whether scarification of the kidney (nephrotomy) is likely to restore the flow. In cases uncomplicated by suppression the sole pathological condition would appear to be brown granular material in the lumen of the renal tubules.

The next section deals with the question of the origin of the hæmoglobinuria. The authors conclude that it is dependent on an accompanying hæmoglobinæmia, though there is not sufficient evidence to show the situation where the blood is destroyed. With regard to the action of quinine, it may produce hæmoglobinuria in two ways: (1) It may somehow initiate the process; or (2) It may simply accelerate a process already going on, but not sufficient in amount to produce hæmoglobinuria; and in this connection the authors quote A. Plehn, who recorded twenty-four cases of blackwater due to malaria alone. The article concludes with the clinical records of seventeen cases and several tables of the condition of the urine, of the relationship of the taking of quinine to the hæmoglobinuria, of the condition of the blood, etc. The article is illustrated with eighty-two figures and two coloured plates, and must be carefully studied by all those interested in the blackwater-fever problem.

References.—[1]*Arch. f. Schiffs u. Trop. Hyg.* Bd. ii. No. 17, in *Brit. Med. Jour.* Nov. 21, 1908; [2]*Jour. R.A.M.C.* June, 1908, in *Ther. Gaz.* Oct. 15, 1908; [3]*Med. Press*, May 19, 1909; [4]*Ann. of Trop. Med. and Parasitology*, Vol. iii, No. 1, Oct. 1, 1909, pp. 1-256.

BLADDER, DISEASES OF. *E. Hurry Fenwick, F.R.C.S.*

Extroversion of the Bladder.—It is not yet settled which is the better method of treating this distressing congenital malformation: whether by implanting the intact ureters with the uninjured trigone into the sigmoid (Maydl, 1892), or the extraperitoneal implantation of the ureteric orifices, with a rosette of the mucous membrane around each, into the rectum (Lendon-Peters, 1899).

Buchanan,[1] who has written ably upon Maydl's operation (trigono-sigmoid implantation), refers to 80 patients upon whom it has been tried. The mortality was 28·7 per cent. It is noticeable that four-fifths of all the deaths can be attributed to two causes, the intra-peritoneal nature of the operation, and obstruction of the ureters from twisting or kinking. Perfect continence is reported in nearly all cases, patients being able to retain urine from three to six hours without discomfort. Of 64 cases, well at the last report, 13 have survived the operation a year, 26 between one and three years, 10 between three and six years, and 15 between six and twelve years. The important factors in the prevention of ascending infection after ureteral implantation, according to Buchanan, are: Each ureter should pass in a direct course without kink or twist to the point of entrance into the bowel. There should be no injury by forceps, knife, or needle, of or near the ostium, that could cause a cicatricial narrowing of the passage. The intra-intestinal portion should keep its position without tension. No injury should be done the ureter by retention sutures. The ureteral catheter should be used as a guide in dissection during operation, but not as a conductor of urine afterwards. No dilatation of the sphincter ani should be practised, and only a rubber tube used to prevent distention.

An interesting addition to the literature of exstrophy of the bladder, because of its freshness and completeness, is the account of the operation upon a woman, aged 31, by Lawford Knaggs.[2] It must be at once obvious that the uterus and broad ligaments, interposed as they are between the back of the bladder and the rectum, form the chief obstacle to the extraperitoneal method, and it is necessary, therefore, for the uterus to be removed. To be rid of this viscus is very desirable from the patient's point of view, because the menstrual periods add very materially to her distress, both bodily and mental; and by the retention of a pool of decomposing fluid in the misplaced vagina, the disgusting urinous odour from which she is never able to escape, is rendered peculiarly fœtid; indeed, so far as Knaggs' experience goes, the condition of a woman who suffers from ectopia vesicæ is far worse than that of a man. After two operations of considerable difficulty, the urine could be retained for four and sometimes five hours, and only a slight leakage remained through a fistula in the wound.

Thomson[3] and Dowden[4] have recently recorded cases in which they have united the ureter to the large bowel. In the latter case, the procedure adopted was to implant the duct into a loop of bowel excluded by lateral anastomosis of the iliac and pelvic colon.

Recurrence of Vesical Calculi after Removal.—At the present epoch, when surgeons are leaning towards the cutting operation for stone in the bladder, and removing even small stones from that viscus by the suprapubic incision, Southam[5] makes a very interesting point as regards the recurrence of stone after it has been removed from the bladder by crushing or cutting. The result of his cases may arrest the attention of surgeons who neglect the practice of crushing because of the ease of cutting, and who justify their action by stating that recurrence is much oftener noticed after the former procedure. The investigation was suggested to Southam's mind when he had performed litholapaxy for the sixth time within a period of sixteen years upon the same patient. Up to the present time he has operated on 160 occasions for the removal of vesical calculi, and finds that recurrence is as common in male patients after cutting as after a crushing operation; in fact, in his experience it has been practically the same, viz., 7 per cent. He considers that recurrence after either operation is probably due to the descent of a fresh calculus from the kidney, and its retention in the bladder.

Extirpation of the Bladder.—This operation has been revived and been found, with careful selection of cases and with a previous bilateral ureterostomy (*vide* URETERS) on to the skin, or nephrostomy, to be a valuable addition in the treatment of incurable cancer of the bladder (*vide Med. Annual*, 1909, page 160). Rihmer,[6] of Budapest, gave his experience at the Congress there. After recording his general results, he turned to the difficult question of the implantation of the ureters. He considered the best results were obtained by implanting them in the skin surface of the body, while implantation into the rectum must be given up. In none of his cases had recovery taken place.

Formation of an Artificial Bladder.—He also referred to the modern idea of making an artificial bladder out of the rectum and short-circuiting the intestine by means of an artificial anus. Verhoogen and de Graeuwe (Brussels), who spoke on the same subject, said they had obtained the best results by leaving the ureters open in the wound or by suturing them to the skin. The results of implantation into the bowel had been very bad. After performing nephrostomy, they suggested making a cystectomy with ureterostomy into the cæcum, which would be isolated for this purpose. This plan they have followed, but without success (oral). This was suggested orally three years ago by Mr. Keetley, who thought the cæcum and even the transverse colon might be excluded from the rest of the intestinal tract, and after waiting a few days or longer to thoroughly cleanse them from the remains of fæcal matter, to use the bowel as an artificial bladder which the patient could empty by catheterizing the appendix. Compare bilateral ureterostomy (URETERS).

REFERENCES.—[1]*Surg. Gyn. and Obst.* Feb. 1909; [2]*Brit. Med. Jour.* Oct. 24, 1908; [3]*Edin. Med. Jour.* Jan. 1909; [4]*Ibid.*; [5]*Lancet*, June 5, 19, 1909; [6]*Brit. Med. Jour.* Oct. 23, 1909.

BLEEDING. *Carey F. Coombs, M.D., M.R.C.P.*

The legitimate position of bleeding in clinical therapeutics is defined by Hale White[1] in an admirable clinical lecture. Venesection is *indicated* for the relief of right heart engorgement such as is seen in mitral disease, bronchitis, and pneumonia. Such patients are distressed, cyanosed, and orthopnœic; with distended veins, but a small arterial pulse. After bleeding, the pulse improves and cardiac tonics act more effectively, the heart being again able to grip its contents. Only those cases of pneumonia where lividity is marked are likely to benefit. Its value in cerebral hæmorrhage is doubtful, but it is a useful means of checking status epilepticus, puerperal eclampsia, and uræmic convulsions where arterial tension is high. Sometimes it will relieve the pain of aneurysm where other means have failed. It is *contraindicated* at the extremes of life, in anæmic persons, and in those disposed to hæmorrhage. The amount to be withdrawn from an adult (leeches are preferable in children) varies from 10 to 20 oz.; the best guide in any given case being the state of the pulse. The patient should sit up, so that signs of faintness may not be overlooked.

The action of leeches has been investigated by Weil and Boyé.[2] They find that the leech-bite causes an acute transitory hæmophilia, practically confined to the neighbourhood of the bite. Intravenous injection of extract of leeches into animals causes a general hæmophilia, and cases are recorded where their application to human beings has induced a tendency to spontaneous hæmorrhages.

REFERENCES.—[1]*Clin. Jour.* Mar. 31, 1909; [2]*Sem. Méd.* Sept. 8, 1909.

BLOOD, EXAMINATION OF. *George Lovell Gulland, M.D.*

Blood Examination in Appendicitis.—Coons and Bratton[1] insist on the value of blood examination in these cases; but point out, what has for a long time been felt, that mere leucocyte counting gives comparatively little help. They lay more stress on the proportions of polymorphonuclears, especially when they are taken into consideration along with the total count. The cases, numbering 184, are detailed very fully, and the conclusions to which they arrive are as follows:—

Polymorphs below 75 per cent; if there is a leucocytosis, one may look for an old infection, well walled off, in which there may be an acute exacerbation; usually there is a mild secondary anæmia.

Polymorphs from 75 to 80 per cent; rather indefinite. The history of the case and the patient should be considered. In their series, 32 were of this type; 15 were abscesses; 11 acute suppurative appendicitis.

Polymorphs from 80 to 85 per cent; the patient is not in immediate danger unless the total of the leucocytes is low, suggesting impaired resistance. If the leucocytes are increasing, immediate operation should be advised, if the relation of the polymorphs to the total leucocyte count indicates a good resistance. If the leucocytes remain stationary, or decline, the surgeon should rely on the physical signs when making up his mind to operate.

Polymorphs from 85 to 90 per cent : Look for a severe infection. If there is a good leucocytosis, immediate operation is indicated.

Above 90 per cent : a violent infection, and grave prognosis. When there is no increase of the leucocytes, and the polymorphs are high, little hope can be entertained for the patient from operation.

The relation between polymorphs and total count is brought out in a chart, for which the original paper should be seen.

Blood Platelets.—H. C. Ross[2] has utilized the agar jelly method, published by himself,[3] in order to study the structure of the blood platelets. R. Ross, Moore, and Walker[4] discovered red spots in polymorphonuclear leucocytes which they concluded to be centrosomes, when the cells were stained by this method. H. C. Ross determines that they are diffusion vacuoles. They become gradually larger, and when the leucocytes die, the spot suddenly disperses, owing to the liquefaction of the cytoplasm. He finds that the same spots can be made out in the platelets, and their time of appearance and dispersion are practically the same as those in the polymorphs. The procedure is facilitated by adding morphia to the jelly, and this also promotes the vacuolation of leucocytes, probably because of its poisonous action, which lowers the co-efficient of diffusion. All the platelets in a plasma usually become vacuolated at the same time, and Ross therefore concludes that they belong to one class of cell and are derived from one source. He believes, in short, that they are parts of the cytoplasm of leucocytes, and rejects the theory that they are precipitates from the plasma, and also that they have their origin from the nucleus of red corpuscles.

The Blood in Chorea and Rheumatism.—C. J. Macalister[5] discusses the relation between these two diseases from a new standpoint. He adduces some statistical evidence to show that chorea may be an infective disease, and then proceeds to study the question whether the toxin of chorea and that of rheumatism are identical. For this purpose he utilizes the method published by H. C. Ross[6] for telling whether leucocytes are living or dead, by examining the blood on an agar film containing atropine and a stain. Ross has also shown that if the leucocytes of a healthy person are placed in the plasma of another healthy person, they live a shorter time than they do in their own plasma under these conditions : whereas, if they are placed in the plasma of persons suffering from diseases due to or associated with toxins in the blood, their lives are greatly shortened. The results of Macalister's experiments, were that there appears to be in the blood-plasma of patients suffering from chorea, a poison which is toxic to the leucocytes of healthy persons ; while in the case of rheumatism, the plasma is hardly ever poisonous to healthy leucocytes. It was further found that, when the corpuscles of a rheumatic patient are placed in the plasma of patients suffering from chorea, their lives were invariably shortened. One may infer from this that, at all events, some difference exists between the poisons in the two conditions. Another point which is suggestive of difference between the two conditions is that in

chorea there is a marked eosinophilia, varying from 16 per cent to 20 per cent. The presence of intestinal parasites, etc., is excluded in the usual way. Eosinophilia is never present in acute rheumatism. These observations seem to show that there is less real association between chorea and rheumatism than is generally thought to be the case, and that chorea may be due to a distinct toxæmia.

REFERENCES.—[1]*N.Y. Med. Jour.* July 31, 1909; [2]*Lancet*, Sept. 4, 1909; [3]*Ibid.* Jan. 16, Feb. 6, 1909; [4]*Ibid.* July 27, 1907; [5]*Brit. Med. Jour.* Aug. 28, 1909; [6]*Lancet*, Feb. 6, 1909.

BLOOD-PRESSURE. *Carey F. Coombs, M.D., M.R.C.P.*

Arterial Pressure.—The past twelve months have seen a continuation of the controversy about the accuracy of the methods in use at present for the measurement of arterial pressure. One party argues that the reading given by the various forms of sphygmomanometer represents accurately that which it is meant to represent, that is, the pressure exerted upon the inner surface of the arterial wall by the blood distending the artery; the opposite view is that the reading represents the sum of two forces, namely, the actual arterial tension as defined above, plus the resistance of the arterial wall. This latter, it is said, is so variable a factor as to nullify the value of sphygmomanometric readings.

Russell,[1] of Edinburgh, in a post-graduate lecture, reverts to his well-known theory of arterial hypertonus. He believes that readings of high pressure are to be ascribed to resistance on the part of a vessel whose lumen is narrowed and its walls thickened by muscular contractions provoked by pressor substances within the blood acting direct on the arterial musculature. He instances the pressures of 100 mm., and higher, found in persons dying of cachexia, and suggests that the reading is so high in spite of deficiency in the volume of circulating fluid because the arteries contract down upon their inadequate contents, thus thickening their walls and sending up the "blood-pressure" record of the sphygmomanometer. In another paper[2] Russell describes experiments made with arteries from patients in whom during life the sphygmomanometer had given high blood-pressure readings, which relate to manometric readings of the force needed to stop a stream of water trickling through the arteries. They go to support the view that a large share of such high-pressure readings is due to a thickened arterial wall resisting the compression of the armlet of the sphygmomanometer to an abnormal degree. Similar experiments are reported by Herringham and Womack,[3] with similar conclusions. Hill, Flack, and Holtzmann,[4] upholding the opposite view, object to these experiments on the ground that the obliteration of a steady stream is not the same as the obliteration of the pulse-wave.

Williamson[5] records readings of blood-pressure in Marathon racers before and after practice runs, also in hospital residents before and after running up and down stairs. The result was a rise of 30 to 40 mm. in systolic pressures, up to 160 or 170 mm. This, he thinks, probably represents the limit of the heart's reserve power. Readings

of 300 mm. and others of greater height are therefore partly to be ascribed to an abnormally resistant arterial wall.

The same writer[6] records differences between the blood-pressure readings in the arm and leg, taken in the horizontal position, in arteriosclerotics. Hill, Flack, and Holtzmann,[4] in their case for the accuracy of sphygmomanometry, find on the contrary that such differences disappear if the arm and leg pressures are read synchronously, and the averages of a number of records are arrived at. They did, however, find a marked difference between arm and leg pressures in persons with aortic regurgitation, also in healthy persons after violent exercise, the leg pressure being in each instance the higher. The pressure is lower in a heated than in a normal limb. All these differences they ascribe to variations in the conductance of the pulse-wave, not to varying resistance on the part of the compressed arterial wall. In another paper[7] they adduce very ingenious arguments in support of the accuracy of the sphygmomanometer as a reader of arterial pressure.

A good account of the various *forms of sphygmomanometer* will be found in a lecture by Sir Lauder Brunton,[8] and a conveniently small instrument is described by Pinali.[9] Brunton gives the normal average systolic pressure at different ages as follows: From 8 to 14 years, 90 mm.; from 15 to 21 years, 100 to 120 mm.; from 21 to 65 years, 120 to 150 mm. In women it is about 10 mm. below this.

Abnormally low pressures are associated with the debilitating influences of overwork, underfeeding, and acute disease, especially influenza. It may, he thinks, be premonitory of tuberculosis. It is an indication for general tonic treatment, with cardiac tonics in a few cases.

THE TREATMENT of high arterial tension is also discussed at length in Brunton's paper. He advises a minimum of butcher's meat, and allows little or no alcohol, tea, coffee, or tobacco. Water is to be taken sparingly with meals, plentifully three hours after.. As a rule the diet should consist of bread, vegetables, fruit, milk, butter, and fat bacon, with eggs, fish, and fowl if the tension is not very high. The requisite drug treatment falls under four headings: (1) **Purgation** by blue pill 3 to 5 gr., or calomel ½ to 1 gr. overnight, followed by a saline in the morning, two or three times a week; (2) **Iodide of Potassium** 1 to 10 gr. thrice daily for two out of every three weeks; (3) **Vaso-dilators,** ammonium or sodium hippurate 5 to 10 gr., or sodium benzoate 5 to 30 gr. thrice daily, or the nitrites. For a moderate dose of nitrites he recommends the following prescription:—

℞	Sodii Nitrit.	gr. ij	Sodii Bicarb.	gr. x
	Potassii Nitrat.	gr. xx		

In a tumbler of water every morning.

(4) Anginal attacks are sometimes relieved by a mixture which induces the passage of flatus, such as:—

℞	Liq. Trinitrini	℥ss–iij	Sp. Chlorof.	℥v - x
	Sp. Ammon. Aromat.	℥xv–℥j	Tinct. Card. Co.	℥x–xxx
	Sp. Æther Co.	℥v–x	Aq. Menth. Pip.	ad ℥j

To be repeated every quarter of an hour till it causes giddiness or relieves the attack. For very acute attacks an inhalation of **Nitrite of Amyl** is best. If this fails, pour a few drops of **Chloroform** on a piece of blotting paper at the bottom of a tumbler; let the patient hold this and inhale the chloroform. As soon as it takes effect the hand falls and inhalation ceases. Chloroform may be given in those fortunately rare cases where an injection of morphia (a rather risky remedy except for the severest attacks) has failed to stop the pain. Williamson[10] describes cases in which a marked fall in arterial tension occurred under treatment with **Potassium Iodide** (5 gr. three times daily) and systematic doses of **Calomel.** In one case **Aspiration of a Pleural Effusion** was followed by a fall in arterial pressure.

The relative value of the different **Nitrite Compounds** as depressors of arterial tension has been thoroughly investigated by Matthew.[11] His results are, briefly, as follows. The tabellæ of nitroglycerin are inert, and so is potassium cobalto-nitrite. For immediate action a 2-drop dose of liquor trinitrini is most useful (amyl nitrite is not included in his investigations), but it only acts for half an hour. For maintained action, erythrol tetranitrate and mannitol hexanitrate are the most efficient. In each case a small dose should be used at first, as individual susceptibilities vary; the action is, however, not cumulative. The dose of the former is ½ to 1 gr., of the latter 1 gr. every six or eight hours, Martindale's chocolate tablets being a convenient form for administration. The nitrites of sodium and potassium in 2-gr. doses must be given every two hours to produce a maintained vasodilatation and lowering of pressure.

Arterial Pressure and Broken Compensation.—Lang and Manswetowa[12] find that arterial tension is high in the "broken compensation" stage of cardiac disease, especially in those cases where the right heart is overcharged and the systemic capillaries are engorged. A fall of systolic pressure, sometimes amounting to 30 or 40 mm., accompanies restoration of compensation. There is no relation between these variations of pressure and the behaviour of œdema.

Microsphygmy is a permanent condition of the pulse associated with idiocy, and occasionally with other congenital abnormalities, such as ichthyosis, consisting in a wave of small amplitude, regular in rhythm, with a normal arterial tension. It is discussed at length by Richet and Saint-Girons.[13]

Venous Pressure.—Hooker and Eyster[14] describe an apparatus which they have devised for the estimation of venous pressure. They allude to cases in which such estimations were made; in one, a case of mitral disease, the venous pressure seemed a more accurate index of progress than either pulse-rate or arterial pressure.

References.—[1]*Lancet*, Feb. 15, 1909; [2]*Brit. Med. Jour.* Oct. 10, 1908; [3]*Proc. Roy. Soc. Med.* Nov. 1908; [4]*Heart*, 1909, Vol. i. No. 1; [5]*Brit. Med. Jour.* Feb. 27, 1909; [6]*Proc. Roy. Soc. Med.* Feb. 1909; [7]*Brit. Med. Jour.* Jan. 30, 1909; [8]*Lancet*, Oct. 17, 1908; [9]*Il Policl.* (sez. prat.), May 2, 1909; [10]*Clin. Jour.* June 30, 1909; [11]*Quart. Jour. Med.* Apr. 1909; [12]*Deut. Arch. f. klin. Med.* 1908, xciv. 455; [13]*Rev. de Méd.* Nov. 1908; [14]*Johns Hop. Hosp. Bull.* Sept. 1908.

BOILS. *E. Graham Little, M.D., F.R.C.P.*

Jackson[1] disputes the existence of a " constitutional state causing boils," to which the term " furunculosis " is usually given. He regards boils as uniformly derived from external infections, and he treats them invariably in the following manner: When the boil is " pointing," a fine-pointed stick with a small quantity of cotton-wool wound round it is dipped into 95 per cent solution of **Carbolic Acid** and bored into the softened point of the boil, which is never to be squeezed. The surface of the skin in the neighbourhood of the boil is then washed over with peroxide of hydrogen, and a 5 to 10 per cent **Salicylic Acid Ointment** spread over the boil and adjacent region, and kept constantly in apposition with the part for a week. If the boil has not pointed, it may be aborted by injecting into it a 5 to 10 per cent solution of carbolic acid, or by touching the top with 95 per cent carbolic acid, the salicylic acid ointment being used as above detailed.

Furunculosis treated by Vaccines.—Lydall[2] quotes a personal experience of benefit by injections from a culture of *Staphylococcus aureus* made from the pus collected from an abscess in his neck. He had suffered at intervals for five years from painful boils terminating in large abscesses. On the appearance of the well-known series of symptoms, he resorted to the vaccine method. 500 million of his own staphylococcus were injected subcutaneously at intervals of twelve days. The relief was immediate, and the boil aborted without going on to abscess formation, which on previous occasions had been the inevitable sequence.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* June, 1909; [2]*Midland Med. Jour.* Jan. 1909.

BONE CAVITIES.

(*Vol.* 1909, *p.* 166)—Walton has had very successful results following the injection of **Paraffin** with a melting-point of 120° F. into the cavities containing chronic abscesses in thin bone. The cavity is first scraped out, and swabbed with pure carbolic, followed by a formalin-gelatine solution; it is then dried with hot air, after which the paraffin is injected.

BRAIN, SURGERY OF. *K. W. Monsarrat, F.R.C.S.*

TECHNIQUE.

Cushing[1] considers the " two-stage " operation undesirable, especially in suboccipital work. He points out the value of decompressive operations in relieving the symptoms of general pressure in *tumours* whose situation is undiagnosed, and in giving time in a certain number of such cases for the development of focal symptoms pointing to the situation of the growth. In tumours above the tentorium, a continuous lumbar drain during the course of an operation for decompression or extirpation is often an invaluable assistance; in suboccipital operations, however, lumbar puncture is both dangerous and unnecessary. In the course of a suboccipital operation, the posterior cisterna is opened and the fluid escapes from above. In deep

explorations, when approach has to be made to a lesion difficult of access, it must be made possible to dislocate the cerebral and cerebellar tissue by a bilateral opening. This is especially exemplified in cerebellar operations and in operations to deal with pituitary growths. Seventy-four *Gasserian ganglion* operations were reported, with two deaths, early in the series. The lower route of approach was favoured, and the operation confined to avulsion from the pons of the sensory root.

In the course of a discussion following this paper, Dr. Willy Meyer dwelt on the desirability of wide removal of bone to provide easy access to the brain. He considered that, in the interest of asepsis, the work should be completed at one sitting. He related a case of operation for tumour of the auditory nerve from the left cerebellar fossa.

Hartley[2] writes a valuable summary of operative technique. He describes what he calls five "prime requisites." (1) Instruments which will open the skull quickly; he himself uses motor, saw and guard, osteotome, drill, fraise, and measure. (2) An accurate method of cerebrocranial topography—the one which he employs being Chipault's. (3) Osteoplastic flaps, varied according to the exposure required: for the sides of the cranium, four-sided flaps with the narrower extremity at the temporal fossa; for the exposure of both sides at once, bilateral four-sided flaps, also with their hinges in the temporal fossa, or single six-sided flaps. (4) The replacement of bone in every possible case, or the covering of the defect with an accurately fitting foreign material, celluloid or aluminium; bone replacement to be preferred. (5) Perfect hæmostasis both in preliminary and final steps. He places the patient on the table, the head of which is raised between 15 and 30 degrees. For hæmorrhage he uses a tourniquet. For hæmorrhage from the brain itself, ligature of every vessel before cutting is requisite, and capillary hæmorrhage is managed with moist gauze at 115° or 120°. An accident to be guarded against is opening of the lateral ventricles.

Frazier[3] says of the modern operation for *trigeminal neuralgia*, that of all the operations on the central nervous system, in none has a greater degree of perfection been attained, and with none are the results so eminently and enduringly satisfactory. He prefers to perform the operation with the patient in the sitting posture. The approach to the ganglion is made through an auriculo-temporal opening, which affords the most direct and shortest route to the sensory root of the ganglion, and the operation is completed by avulsion or division of this root. In the same paper he discusses the question of operation in *cerebral trauma*. Decompression should be considered in cases in which the patient's condition, though not desperate from the first, becomes progressively more serious—unconsciousness deepens, relaxation takes the place of restlessness, the respirations become more stertorous, and Cheyne-Stokes in type, and the pulse slower. Whether the decompression should be done in the temporal or the subtentorial region is a problem for the future.

For the *arrest of scalp hæmorrhage*, Frazier prefers the old-fashioned Petit's tourniquet, with a compress of gauze in each temporal region under the band. He uses Cryer's spiral osteotome for the bone section, iodoform wax for the bone, and the finest catgut ligatures for the pial vessels. The two-stage operation, formerly so widely advocated, he no longer considers necessary. With regard to subtentorial operations, he formulates the following conclusions: Exploratory and decompressive operations in the posterior cranial fossa are more risky than those in other parts of the brain; the great majority of tumours are situated in the pontine angle; while the operability of tumours in this region is doubtful, decompression gives invaluable results; lastly, lumbar puncture, either as a diagnostic or therapeutic measure, should never be resorted to. He prefers the head-up lateral position for the patient.

He makes the following remarks on *decompression for epilepsy*: "I am convinced that in some cases at least the improvement after the operation is very striking. Though acknowledging some scepticism as to the theory on which the operation is based, I have resorted to it a number of times, and have under observation some fifteen to twenty patients already operated on. For obvious reasons, the results must not be published until five years have elapsed. Whatever may be said, pro or con., as to the propriety of operating in cases of the so-called idiopathic type, in cases without a suggestion of a focal lesion I have been surprised to find, in a large percentage of them, the brain when uncovered presented some gross pathologic lesion (adhesions, œdema, the remnants of an old pachymeningitis, etc.) so frequently, that it would appear that the so-called idiopathic type is a little less prevalent than we were led to believe before we had so many opportunities as now for studying the living pathology of the brain and its membranes."

Cryer[4] has described anew his spiral osteotome driven by a hand engine or electric motor. This instrument has been in use in some hands for a number of years. Frazier employs it for all his craniotomies, and it undoubtedly provides a rapid method of bone section, and, with care, a safe one.

Krause,[5] in his text-book on the surgery of the brain and spinal cord, describes the following points of technique: For hæmostasis of the scalp he uses either a continuous suture above the flap and beneath its base, or preferably Kredel's plates fixed by silk sutures passing beneath the soft parts. The skull is opened with Doyen's burr, and the flap cut with Dahlgren's forceps. Hæmorrhage from the bone is stopped by a few strokes from a small special mallet, or in the case of the diploë by minute gauze pledgets. In the case of new growths Krause operates in two stages, the second operation being undertaken eight to fifteen days after the first. In reference to pituitary growths, he mentions the anterior route, and relates a case of removal of a bullet from the chiasma through this mode of approach, and another of extirpation of a tumour of the base near the sella

turcica. He does not appear, however, to have actually attacked a pituitary tumour by this route, and as a matter of fact it does not provide easy access. He remarks that large portions of the cerebellar hemispheres may be removed without damage, and when searching for a tumour here, he does not hesitate to make a complete transverse section of a hemisphere. The most fatal and difficult complication after operation is prolapse. Asepsis and primary suture of the flap are the measures which guard against this accident.

Palliative Operations, and Operations for Relief of "Optic Neuritis."

Spiller[6] has summarized the general view on the subject of *Palliative Decompression*. He is able to show that for the preservation of vision its value is universally recognized. Its greatest effect is seen when done at a comparatively early stage. In the usual case there is gradual subsidence of optic neuritis, beginning about the tenth to the fourteenth day, and complete disappearance in from six weeks to two months. He states that some have held that it would be well to rest content with decompression when the tumour is in the posterior cranial fossa, and not to attempt its removal because of the danger in so doing. While quoting Bruns as not sharing this view, he says that he himself is partly persuaded that in many cases decompression is the best procedure, as the attempt to remove a tumour of the posterior cranial fossa usually terminates fatally, or the condition of the patient after removal of a tumour from the cerebello-pontine angle is so pitiable, that death is welcomed as a release. "It is true that a few brilliant cases are on record, but there are many failures. Further improvement in technique may make these operations on the posterior cranial fossa more successful. I am referring especially to the cases in which the tumour is in the cerebello-pontine angle." Lumbar puncture is not to be recommended, either for diagnostic or therapeutic purposes, in suspected brain tumour.

It is sometimes difficult to decide what is best to be done when choked discs are the only sign of intracranial disease. In some such cases valuable time may be lost by attempting to relieve the symptoms by mercury and iodide. Sometimes retinal hæmorrhages follow a decompressive operation, but this does not appear to prejudice the prognosis as to vision, as the hæmorrhages disappear with the subsidence of the signs of œdema. In advanced cases of cerebral tumour which have reached the stage of stupor, Spiller doubts the utility of an emergency decompression, though he expresses no dogmatic view on the matter.

An important report on "the operative treatment of papilloedema dependent upon increased intracranial tension" has been published by de Schweinitz and Holloway.[7] They analyze 161 cases from American literature, and 51 from their personal experience; of these they find sufficiently complete information in 98. In 37 a radical operation was performed; improvement or preservation of vision

was secured in 22, the remaining 15 being failures. In 27, exploratory operations were performed, and improvement or preservation of vision was secured in 9, 18 being failures. In 34 the operation was a decompressive procedure, improvement or preservation of vision was secured in 26, the remaining 8 being failures. Adding the figures together, improvement or preservation of vision was secured in 58·2 per cent. The condition of choked disc is present in about 80 per cent of cases of brain tumour. It is especially well marked in cerebellar cases; it is either late, or fails entirely, in tumours of the pons, medulla, and corpus callosum, and this lateness of development is also to a certain extent true of tumours of the frontal lobe or parietal convolutions. In considering the advisability of a palliative operation, the ophthalmoscopic appearances are, therefore, not the only guide. In some cases before it develops, attacks of temporary amaurosis may be a feature, lasting from a few minutes to a few hours. These attacks are the result of compression of the chiasma by the bulged floor of the third ventricle. With a view to saving vision, palliative operation should be done on the first sign of visual failure, whether optic neuritis is present or not.

After operation, subsidence of the swollen disc was noted in the writers' experience as early as the end of the first day, and as late as the twentieth, with an average of a little over nine days. Some doubt has been thrown by recent writers on the doctrine that the greater swelling of one disc points to the growth being on that side of the brain, but de Schweinitz and Holloway support the old view on the whole; of more importance are signs pointing to the longer duration of œdema on the one side than on the other.

Decompressive trephining gives excellent results as to preservation of vision if done during the first, second, or third stage of neuritis. If for any reason it is postponed until the development of the fourth and fifth stages already associated with marked depreciation of vision, the prognosis as to sight is unfavourable; but even under these circumstances the operation should be performed, because it sometimes preserves such vision as still remains.

Bordley and Cushing[8] discuss the whole question of choked disc, with special reference to decompressive cranial operations. It is their view that the early injection with stasis of the vessels, the marked œdema, with projection of the papilla, and the ultimate round-celled infiltration with new tissue formation which leads to atrophy, are merely stages of the same process; further, that the view which ascribes this process to mechanical causes is largely correct, and that the lesion is primarily due to the crowding into and distention of the sheath of Schwalbe by obstructed cerebrospinal fluid resulting in an œdema of the nerve head. They believe also that an acute internal hydrocephalus in the closed adult skull almost inevitably leads to a choked disc, but that this is to be attributed to the presence of arachnoidal fluid forced into the optic sheath rather than to an œdema spreading from the brain to the optic nerve. Since choked

disc is rare in meningitis, and equally so in abscess unless there is an obstructive hydrocephalus leading to greatly increased pressure, meningeal inflammation of itself must be looked on as an unlikely source of the lesion. Finally, since there is an almost uniform subsidence of choked disc after decompressive operations, whether conducted for the pressure of tumours, cerebral œdemas of one sort or another (traumatic, nephritic, or vascular), infections, or intracranial hæmorrhages, a mechanical rather than a toxic process must play the chief rôle in its causation. Bordley and Cushing have also drawn attention to a sign of cerebral tumour which they consider among the earliest to appear; that is to say, in the visual field for colour the colour lines are reversed, and there are also blue-blind areas. Full details of these observations have not yet appeared.

Sir William Gowers[9] reports an interesting case of unilateral "optic neuritis" where a growth underlay the frontal lobes. This had compressed the left optic nerve chiefly; there was, however, no optic neuritis of the left disc, but a central scotoma. On the right side there was marked optic neuritis. On post-mortem examination, there was no distention of the sheath of the left nerve, but moderate distention of the right sheath. The general rule, however, is that when uniocular neuritis is met with, and suggests by its aspect that it might be due to a cerebral tumour, there is usually reason to believe that it is the consequence of some general cause. In illustration of this rule, the writer relates two cases, in one of which a right neuritis was apparently due to gout, in the other a neuritis of the same side was ascribed to the toxic effects of gas, inhaled in coal mines.

Surgery of the Pituitary Body,

Redford and Cushing[10] have carried out experiments to test the assertion of Paulesco that total extirpation of the gland is incompatible with life. Twenty operations were carried out on dogs, and of these fifteen were successful. After some hours, usually before the second day, the animals became lethargic, and eventually passed into a state of coma. Post-mortem examinations were held on all the animals, without disclosing any adequate cause of death. The results upheld Paulesco's contention, and it is to be inferred that the surgery of the hypophysis must be limited either to the removal of tumours which may implicate the pituitary gland or, in case of hypertrophy, to a partial hypophysectomy.

In a later paper Cushing[11] further discusses the functions of the hypophysis in the light of experimental and clinical observations. He summarizes his conclusions as follows: Two conditions, one due to a pathologically increased activity of the pars anterior of the hypophysis (hyperpituitarism), the other to a diminished activity of the same epithelial structure (hypopituitarism), seem capable of clinical differentiation. The former expresses itself chiefly as a process of overgrowth—gigantism when originating in youth, acromegaly when originating in adult life. The latter expresses itself chiefly

as an excessive, often a rapid, deposition of fat, with persistence of infantile sexual characteristics when the process dates from youth, and a tendency towards a loss of the acquired signs of adolescence when it first appears in adult life. Experimental observations show, not only that the anterior lobe is a structure of such importance that a condition of apituitarism is incompatible with the long maintenance of life, but also that its partial removal leads to symptoms comparable with those which we regard as characteristic of lessened secretion (hypopituitarism) in man. A tumour of the gland itself, or one arising in its neighbourhood and implicating the gland by pressure, is naturally the lesion to which one or the other of these conditions has heretofore been attributed, though it is probable that over-secretion from simple hypertrophy, or under-secretion from atrophy, will be found to occur irrespective of tumour growth when examination of the pituitary body becomes a routine measure in the post-mortem examination of all cases in which the conditions suggest one or the other of the symptom-complex described. When due to tumour, surgery is the treatment that these conditions demand, and at present there are reasonably satisfactory ways of approaching the gland; but clinicians and surgeons must clearly distinguish between the local manifestations of the neoplasm due to involvement of structures in its neighbourhood other than hypophysis, and those of a general character from disturbances of metabolism due to alterations of the hypophysis itself.

Several writers have connected conditions of general adiposity and genital atrophy or infantilism with abnormal conditions of the hypophysis. Marburg[12] groups such cases into three classes: (1) Simple adiposity; (2) Adiposity with genital atrophy; and (3) Simple genital atrophy. These conditions he associates with hypopituitarism, the condition of acromegaly being due to hyperpituitarism.

Hochenegg[13] reports the operative cure of acromegaly in a female patient. The sella turcica was reached from the front. The growth was curetted until only the tough dura lining the cavity was felt. The pathological diagnosis was adenoma of the hypophysis. The symptoms due to the mechanical pressure of the tumour disappeared; but more remarkable were the effects on the acromegalic signs. Five days after operation the patient remarked that her jaws set differently, shrinkage being shown by the lessened distances between the incisor teeth. On the tenth day this change was very marked, and the hands were much diminished in size. One month later the patient was discharged. The signs of acromegaly had continued to improve, her feet had become greatly reduced in size, and her entire appearance was so changed that she was unrecognizable.

V. Eiselberg[14] also employed the nasal route in three cases. The first was a cystic tumour which proved to be an epithelial carcinoma and was associated with headache, double temporal hemianopsia, adiposity, and defective development of the genitals. The other

two cases were acromegalics, and the pathological diagnosis in each was sarcoma; one died two days after the operation from meningitis, the other recovered; improvement in the visual conditions followed, and cessation of the headache. (*See Med. Annual*, 1909, p. 172). This nasal route was first employed by Schloffer.[15] Its danger is the difficulty of preventing infection. Schloffer's patient died of cerebral infection at the end of two and a half months. Sir Victor Horsley approaches the hypophysis from the side, retracting the temporal lobe. A complete report of his procedure and results has not yet appeared.

Church[16] writes of six cases showing either local or general signs of hypophysis tumour or signs of both types. Three were submitted to operation. The first of these was a boy, aged 14, presenting temporal hemianopsia, optic atrophy, right hemiparesis, and headache. He was operated on by Sir Victor Horsley, who evacuated a blood-cyst of the hypophysis; recovery from the operation took place, but he died eighteen months later with signs of intracranial pressure. The second was a woman, aged 25, complaining of headache; there was bi-temporal hemianopsia, no optic neuritis. An X-ray picture showed a great excavation of the sella turcica. Operation by Dr. McArthur was followed by death shortly after. The tumour of the hypophysis was reached from the right frontal region, the frontal lobe being elevated; considerable brain laceration was caused. The third case was operated on by v. Eiselberg by the nasal route. The patient, a male aged 36, complained of headaches; the left optic disc was completely atrophied, and the right was fairly advanced towards the same condition. The field of vision of the right eye showed a temporal hemianopsia. After operation the headaches ceased, and he thought his vision was better, but this could not be proved.

Hydrocephalus.

M'Clure[17] reports experiments on dogs designed to test the value of the drainage of hydrocephalus into a neck vein. The method was employed in one case of hydrocephalus in an infant of ten months. A portion of the cephalic vein was taken from the father's arm, one end was sutured within the dura in the suboccipital region, the other anastomosed with the cut end of the external jugular in the child's neck. Death took place a few hours later, associated with a sudden rise of temperature.

References.—[1]*Jour. Amer. Med. Assoc.* Jan. 16, 1909; [2]*Ibid.* Jan. 9, 1909; [3]*Ibid.* June 5, 1909; [4]*Ibid.* Nov. 3, 1908; [5]*Surgery of the Brain and Cord* (Berlin, 1908); [6]*Jour. Amer. Med. Assoc.* Jan. 23, 1909; [7]*Ther. Gaz.* July 15, 1909; [8]*Jour. Amer. Med. Assoc.* Jan. 30, 1909; [9]*Lancet*, July 10, 1909; [10]*Johns Hop. Hosp. Bull.* April, 1909; [11]*Jour. Amer. Med. Assoc.* July 24, 1909; [12]*Deut. Zeits. f. Nervenheilk.* Dec. 1908; [13]Abst. in *Ann. Surg.* Nov. 1908; [14]*Wien. klin. Woch.* 1909, No. 8; [15]*Ibid.* 1907, No. 21; [16]*Jour. Amer. Med. Assoc.* July 10, 1909; [17]*Johns Hop. Hosp. Bull.* Apr. 1909.

BREAST, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

Rutherford Morison[1] gives a record of cases operated on more than three years ago. In his experience the chief diagnostic difficulties have arisen in deciding whether the tumour is tuberculous or carcinomatous. Deep cysts and chronic abscesses in large breasts may simulate malignant growths so closely that diagnosis without incision is impossible. The most difficult cases for diagnosis and the most unsatisfactory in prognosis are those growths which resemble acute inflammatory swellings; as far as his observation goes, they would appear to be hopeless from their onset. With regard to the **Operation,** he removes both pectoral muscles, and if the lymphatics on the costo-coracoid membrane are enlarged, he looks on it as an indication for removal of the neck glands; and not only those lying in the posterior triangle should be removed, but the sternomastoid should be divided, and the glands lying in the angle between the subclavian and internal jugular veins must be sought for and removed, as they are frequently diseased. Each vessel must be clipped either before or after division, to guard against excessive loss of blood, and the body heat must be maintained to diminish shock. As landmarks, it is useful to define the cephalic vein above as indicating the separation between the pectoralis major and deltoid, the edge of the latissimus dorsi below, and on the outside the axillary vein, from which the dissection should be commenced. The mortality in his cases was small, viz., 1 per cent. Out of 115 cases operated on over three years ago, 31 are alive, and in spite of his having bound the arm down to the side none complain of lack of usefulness in the arm. He ordered that the arm should be used as little as possible during the first six months after operation, the reason being that Morison believes that however radical an operation may be it is unlikely that every cancer germ has been removed, and that avoidance of irritation is, next to a good operation, the most likely means of averting recurrence. In young women, the operation is not complete until both ovaries have been removed, and for this there are two reasons: (1) Pregnancy after an operation for breast cancer, even after years have been safely passed, practically ensures recurrence of the growth; (2) Sir George Beatson has proved that the removal of active ovaries has an inhibitory effect on the growth.

Late recurrences show that cancer germs, like those of tubercle, sepsis, and syphilis, can lie dormant but not dead in the tissues for years, and his present practice is to order a course of **Röntgen** rays after operation. He believes that there is some unknown relation between cancer and tubercle, and that the individual who is predisposed to tubercle in youth is predisposed to cancer at a more advanced age. In this connection he quotes a case of a patient, 50 years of age, on whom he operated for cancer, and found a calcareous nodule under an old scar, the result of a cure of cancer at the age of eighteen by a quack with burnings with caustic. **Open-air Treatment** is ordered after operation on this ground. Recurrence is not always an indication that further operation will be useless. **Oöphorectomy** was performed in

11 advanced cases, with the result that 3 are alive and 8 dead. In young women, breast cancer is particularly malignant, and it is in them only that favourable results may be expected from oöphorectomy. In the cases alive, the time that has elapsed since operation varies from five to eighteen years.

Sir Hector Cameron[2] records some interesting facts regarding mammary cancer. He, like Morison, draws attention to clinical histories which show that cancer germs resemble those of sepsis, syphilis, and tubercle, in their capacity of lying dormant but not dead even for years, and then by some unknown stimulus they can be awakened into fatal activity. In one case he removed a carcinomatous nodule from under the pectoralis major in a woman from whom the breast had been removed for cancer twenty-seven years before. He also records a case of removal of cancer from one breast, and ten years and eight months later cancer appeared in the other breast and was removed. In the first case, where no recurrence took place for twenty-seven years, the axilla had not been opened nor had the axillary gland been removed. He quotes another case to show that even with the limited operation of former days, good results were sometimes obtained. On the other hand, that early operation will ensure success is also fallacious, because it is impossible to know when we operate early and when we operate late. The small size of a growth and its recent discovery by the patient do not necessarily mean that it is of recent origin. Moreover, some cancers of the mamma shed themselves freely into the lymphatic system while still too small to be discovered by the expert touch of the skilled surgeon, and not very seldom even growths of considerable size, and which have been known to the patients for months, have not disseminated as far as the axillary gland, as may be proved when these glands are afterwards removed and histologically examined. Halsted, of Baltimore, has drawn attention to the same facts. Not only ought the surgeon to remove the entire mamma, pectoral muscles, and axillary contents as soon after the discovery of a mammary tumour as he can, but he also ought to remove the entire mamma when operating upon an axillary tumour which appears to be cancerous or is subsequently proved to be cancerous by histological examination, even although he can discover no tumour in the breast. If the second breast be affected with cancer, as a rule it is an episode in the continuous and progressive advance of the disease, and removal of the breast under these circumstances is useless. Cameron has met with two cases where the interval between the occurrence of the disease in the two breasts was in one instance ten and in another six years, and where removal of the second breast was successful; in these cases the disease in the second breast was a fresh outbreak, and not a metastasis.

In some cases operation seems to cause immediate and widespread diffusion of the cancer from mechanical interference with the disease. An analogous occurrence is seen sometimes after operations for surgical tuberculosis and other infective disease, e.g., osteomyelitis. Another

analogy with tubercle and pyæmia is sometimes seen when the metastatic lesions are external. Cases of tuberculosis are seen where numerous subcutaneous tuberculous abscesses form (and these may recover perfectly), but no disease of the internal organs of the abdomen, chest, or head can be found. Cameron also remembers in former days, when pyæmia was more common, that in some cases, so-called "external pyæmia," the lesions remained confined entirely to the external parts, and in such cases recovery often ensued. He has met several cases of disseminated mammary cancer where the lesions remained external, and some of them lived for years. The recrudescence of long latent cancer, as is sometimes seen in a patient who has for many years survived an operation for cancer of the breast, is paralleled in the recrudescence sometimes seen in after life in apparently cured cases of tuberculosis, osteomyelitis, and staphylococcic infection of bone.

In mammary cancer, if the upper and lower axillæ are diseased the prognosis is more doubtful; if there be obvious infection of the skin, especially in the form of detached separate nodules near the seat of the disease, the prospect of long immunity from recurrence is very slight, however large an area of skin be sacrificed, and if the disease is above the clavicle Cameron declines to operate. He thinks both pectoral muscles should be removed, as their absence is hardly at all disabling as regards the future usefulness of a woman's arm, and their removal renders the clearing out of the axilla much more easy.

Crisp English[3] would apparently operate in many cases which some surgeons consider inoperable. In cases of carcinoma in both breasts, he thinks each breast should be considered by itself, and if in each particular breast operation would be advised if the other breast were not affected, he considers both breasts should be removed; in some cases both should be removed at one time, but in most an interval of a fortnight should elapse. [The editor's experience is that in bilateral carcinoma operation is useless as a curative measure.—P. L.] When the supraclavicular glands are involved, operation may give good results in selected cases. Enlarged cervical glands in mammary cancer are not necessarily infected, for microscopical examination of such glands sometimes shows a large-celled hyperplasia without any evidence of cancer infection. For practical purposes these cases may be divided into two classes: in the first, the operable class, the cervical glands are moderately enlarged and not fixed; in the second, inoperable class, the glands are in the form of a fixed mass behind the clavicle, dipping downwards behind the sternomastoid muscle.

As regards *atrophic scirrhus*, unless there be some contraindication, as great age of the patient, visceral disease, or feebleness, operation, in English's opinion, should be performed. Where *pregnancy* exists, removal should be done as soon as possible, unless the disease is too extensive, as mammary cancer spreads with fearful rapidity during pregnancy and lactation. *Renal disease* does not negative operation unless advanced; in diabetes the risk is from the supervention of coma after the operation.

Palliative Operations may be done to prolong life, to prevent fungation, to give relief to pain, and to make the patients more comfortable and happy during the time that remains to them. In cases of doubt the patient should be given the chance of operation.

Sampson Handley[4] gives the following steps of the operation for breast cancer which he has devised in order to carry out the requirements of the permeation theory. The incision should avoid the anterior boundary of the axilla, and the primary growth should be in the centre of the incision. It consists of three parts :. (1) A ring incision, 4 to 5 in. in diameter, accurately centred on the growth and slightly tailing off into (2) above and (3) below. (2) A curvilinear incision for giving access to the axilla ; this begins at the lower edge of the great pectoral muscle near its insertion, and ends—also at the lower edge of the great pectoral—by joining the annular incision. Crossing the base of the axilla, it marks out an almost semicircular flap of skin, whose convexity reaches back nearly to the edge of the latissimus dorsi. A flap consisting only of skin and subcutaneous fat is turned up, its base corresponding to the anterior edge of the pectoralis major. (3) A linear incision coming off from the lower and inner part of the annular incision, and passing downwards for about 2 in. along the linea alba. This incision gives access to the deep fascia of the epigastric region, removal of which is essential. The skin flaps are then undermined in the mid-plane of the subcutaneous fat until a circle 10 or 12 in. in diameter is exposed. In the centre of the circle is the primary growth. The retracted skin flaps should be carefully wrapped in hot towels. An annular incision marking out the 10-in. circle of deep fascia to be removed is now carried down to the muscles, the deep fascia is dissected all round from the underlying muscles, working from the periphery to the centre of the field of operation. It is unnecessary to carry this dissection further than the margins of the muscles which require removal, i.e., the pectoral part of the pectoralis major and the lower part of the serratus magnus —the portion which touches the deep aspect of the mamma. When the fringe of deep fascia has been raised to this extent a blunt instrument is thrust between the clavicular and the costal portions of the great pectoral. The costal origins are raised by a finger thrust beneath them, and they are divided close to the costal cartilages ; the muscle is rapidly stripped from the chest, exposing the origin of the pectoralis minor, which is also divided. The finger is pushed beneath the insertion of the great pectoral, and its tendon divided ; the insertion of the lesser pectoral is then divided close to the coracoid process, the axillary vessels being previously protected by a finger thrust beneath the muscle. The whole mass of breast and muscles is then allowed to fall outwards. The clavicular portion of the great pectoral is dragged upwards by a retractor or divided transversely if necessary. The costo-coracoid membrane, thus fully exposed, is carefully divided just below the clavicle, and the vessels and nerves to the pectoral muscles are severed where they pierce it. Access is

thus obtained to the very apex of the axilla, the most crucial point of the operation, since here are situated the subclavian glands. Failure to remove these glands is a very serious and not uncommon fault of technique in the operation. It is generally followed by recurrence just below the clavicle. The axillary vein is now sought for at the apex of the axilla, and carefully cleared from above downwards. The axilla is then systematically cleared of all fat and glands, care being taken to preserve the subscapular nerves and the nerve of Bell. The digitations of the serratus magnus which are overlaid by the outermost part of the breast are finally divided, first at their origin and next at a point near their insertion into the scapula. Two drainage tubes are inserted, one at the epigastric angle and the other at the posterior margin of the axilla; these are removed at the end of the first twenty-four hours. Handley thinks that the persistent shock, acute pain, and prolonged rapidity and weakness of pulse which formerly followed the operation for breast cancer are almost entirely due to tension in the skin-flaps.

F. S. Dennis,[5] of New York, is sure the more modern so-called radical operation for mammary cancer has given better results; he also thinks that the surgeon should operate in all cases except where the mediastinal glands are infected, or there is visceral metastasis, or the growth is adherent to the chest wall. In three cases where he operated, although he thought there would be very early recurrence, two are alive after nine and five years respectively, with no evidence of any return of the cancer, and both had foul, hæmorrhagic, ulcerating carcinoma with axillary enlargement. In the other case, where a metastasis occurred in the lung ten years after operation, the patient was bedridden with hæmothorax; aspiration relieved the symptoms, she improved, and for many years was in fairly good health. In his opinion the histological formation of the tumour influences in a marked degree the question of permanent cure. The greater the departure from the normal, the nearer the approach to an embryonic type, the greater the malignancy. It is often difficult to determine with absolute certainty that any small nodule in the breast is carcinomatous, and Dennis has adopted a rule that all nodules or tumours in a breast in a woman at the time of or near to or after the menopause, especially with a depressed nipple and skin dimpling, should be removed by a complete ablation of the breast. The risk run is too great if surgical interference is deferred until the diagnosis is made certain. When the patient is a young woman, and the growth is apparently adenomatous, he still thinks the nodule should be removed and examined, and if it is undergoing epitheliomatous changes the entire breast should be removed. In cases of chronic mastitis in a woman over forty, if pain is a constant factor and the interstitial induration is marked, the breast should be removed to prevent the possibility of malignant degenerative changes.

Rodman,[6] of Philadelphia, says the operative results would be better if the profession could be made first to realize, and secondly to

teach the laity, that mammary growths are usually malignant and should be treated and considered as such until their benignity is proved. In about 10 per cent of patients with malignant breast disease, cancer cannot be recognized clinically in its early or operable stage, for in addition to the difficulty of differentiating between solid growths, it is even more difficult to distinguish between benign and malignant cysts, and the diagnosis can only safely be made by the microscope. He emphasizes the fact that cysts are often malignant when they would seem macroscopically, on account of their thin walls and clear contents, to be innocuous, and the degree of malignancy is very great. In these cases the patient's consent should be obtained to a complete operation, and portions of the cyst wall and surrounding

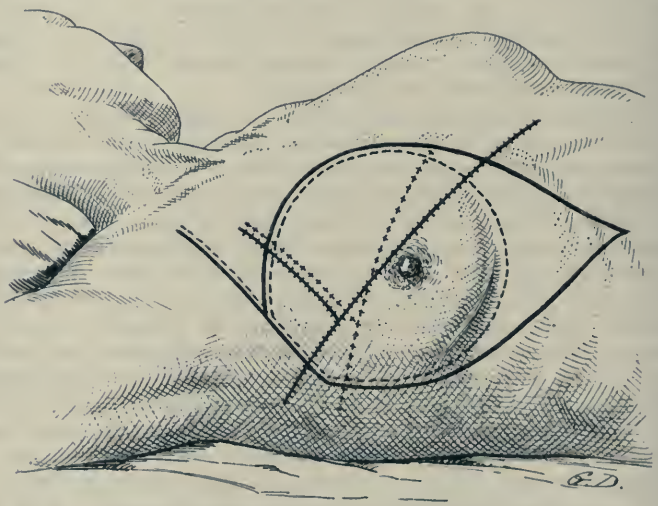

Fig. 7.—Rodman's operation—scheme of the oval and the circular incisions.

tissue submitted to frozen section cutting; mistakes may be made in frozen section work, but they are also made in the ordinary pathological laboratory. The prognosis depends on: (1) The nature of the growth: in order of malignancy they are medullary, scirrhus, adenocarcinoma, and atrophic scirrhus. (2) The presence of palpable enlargement of the axillary glands. Statistics show that 80 per cent of those cases where there was no palpable enlargement are free from recurrence at the end of three years. It must not be forgotten, however, that the glands are nearly always affected, even if not palpably enlarged before operation. (3)The adhesion of the growth to neighbouring structures. Cancer *en cuirasse* is invariably fatal, and so also is acute cancer or carcinomatous mastitis of Volkmann. (4) Involvement of the supraclavicular glands is a very serious factor. Rodman has never known a patient of his own with enlargement of

the supraclavicular glands make a permanent recovery. Lymphatic involvement of these glands may occur early in the history of cancerous growths located in the superior hemisphere of the breast, as there are lymphatics which pass over the clavicle and do not connect at all with the axilla. He invariably explores the neck in all growths situated superiorly. Rodman believes in wide removal of the skin, and commencing the operation by first exposing the axilla and beginning the removal of the breast from this point. *Fig.* 7 shows the lines of incisions: the solid black line represents line of incision for oval operation; the solid black line with crosses represents suturing after oval operation; the broken line represents incision for circular operation, and crossed broken line represents suturing afer circular operation, The advantages of first attacking the axilla are: (1) The axilla may

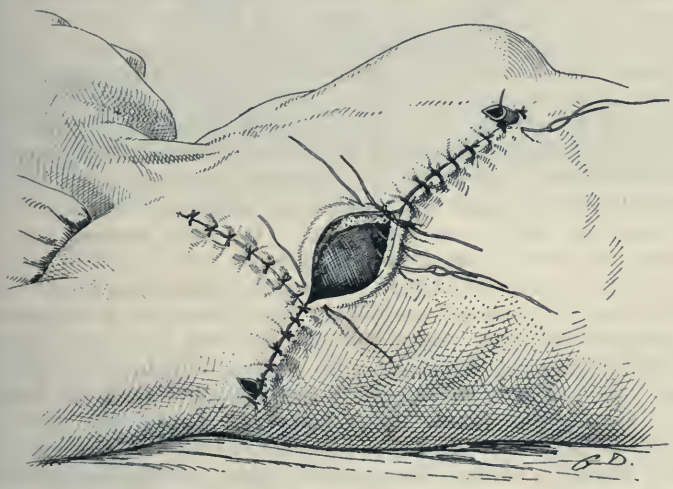

Fig. 8.—Rodman's operation—the wound being sutured.

be so hopelessly involved as to make an attempt at removal worse than useless. (2) The blood-vessels can be reached and tied at their origin, which materially lessens both hæmorrhage and shock. (3) The axillary space is dissected from above downwards instead of from below upwards, because it is both easier from a surgical and better from a pathological point of view, inasmuch as the dissection is begun beyond the encroachments of the disease. (4) Avoidance of the great danger of expressing and distributing cancer cells to adjacent tissues and remote organs as a result of manipulating the infected mamma and lymph-nodes. (5) A dissection *en masse* is sometimes made impossible if the work is begun at the sternum, as the heavy mass may pull on and break the axillary tail. (6) The functional use of the arm will be better.

Rodman's method is well explained by *Plates XXVIII–XXXI*, and

Fig, 8 shows the method of suturing the wound. The middle third of the horizontal incision may be, if necessary, covered by skin-grafting. It is rarely necessary. Latterly the drainage tube at e the end of the horizontal wound is omitted. Following Handley's researches, he has extended the incision over the epigastrium.

References.—[1]*Med. Press*, Dec. 30, 1908; [2]*Brit. Med. Jour.* Mar. 6, 1909; [3]*Pract.* Sept. 1908; [4]*Clin. Jour.* Apr. 7, 1909; [5]*Jour. Amer. Med. Assoc.* May 22, 1909; [6]*Ibid.*

BREAST, HYPERTROPHY OF. *Priestley Leech, M.D., F.R.C.S.*

Sir G. T. Beatson[1] describes a case of this disease where he removed both breasts with successful results. Hypertrophy of the mamma may occur in both married and single women, and as a rule both breasts are affected; the disease may appear in later life, but appears more frequently at puberty; it is often associated with sexual irregularities, both functional and developmental. In the case reported there had only been two menstrual periods, but the patient had always felt ill and out of sorts when menstruation should have taken place; she had a small tumour (adeno-fibroma) removed from the left breast. Since then the breasts have gradually enlarged, and have become a burden to her, especially the right one. She was very stout on admission, and the breasts were large, stood out from the chest, and had a firm, elastic feel. The right mamma was first removed, as it had been observed in other cases operated on that excision of one breast had been followed by diminution of the other. She returned in a year to have the left breast removed, as no improvement had taken place. Since then she has been very well, although the amenorrhœa has continued. On section both breasts looked as if their excessive size was due to an abnormal growth of fat (lipomatosis). Microscopic examination, however, showed the glandular elements of the normal breast in a resting condition, but the number of acini seemed to be fewer than normal, while the intra-acinous fibrous tissue was in excess and very dense in character, though scattered through it were spaces filled with a considerable amount of fat; it thus seems probable that the fat and fibrous tissue make up a large part of these hypertrophied mammæ, though in some cases there may be a true hypertrophy. Most cases would be more correctly described as instances of fibrous hyperplasia of the mamma. Some surgeons, like Birkett, hold that there are two forms of the affection: one in which the breast is firm and large, with the skin over it tense and smooth, while in the other the breast is pendulous, pedunculated, flat, and flaccid. Beatson thinks that these apparent varieties are merely stages of one and the same affection, and that the firm and tense form goes on to the later pendulous and flaccid. The affection is usually chronic, extending over many years, and after reaching a certain size the breasts cease to enlarge. This is not invariably the case, and the affection may take an acute form, during which the mamma assumes great dimensions, a weight of 25 to 30 lb. having

PLATE XXVIII

RODMAN'S OPERATION FOR CANCER OF THE BREAST

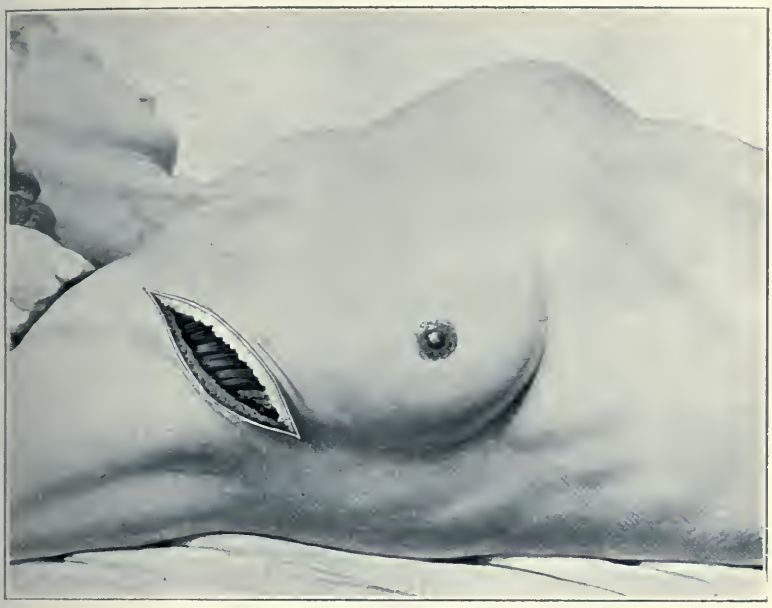

Fig. A.—Primary skin incision

Fig. B.—Division of pectoralis major near its insertion

Fig. C.—Division of pectoralis minor at its insertion

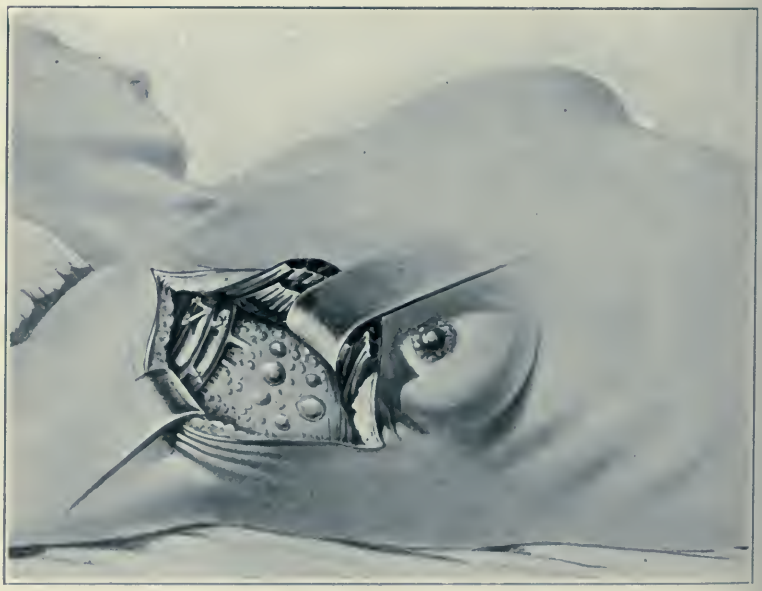

Fig. D.—Axilla freely exposed and vessels divided at their origin

RODMAN'S OPERATION—*continued*

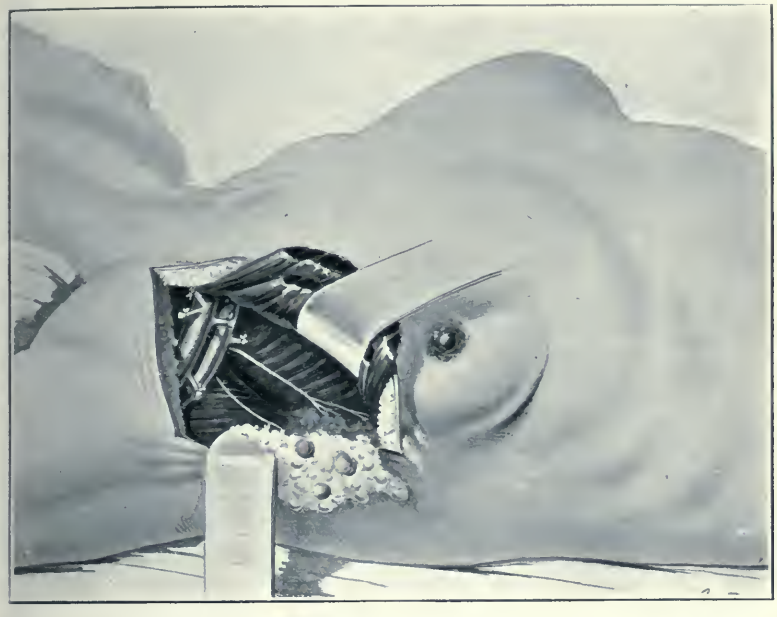

Fig. E.—Axillary dissection completed. Fascia, fat, and enlarged glands en masse shown at base of axilla. External respiratory, or nerve of Bell, shown on the inner wall of the axilla. Subscapular nerve on the posterior wall. Sheath covering all muscles removed

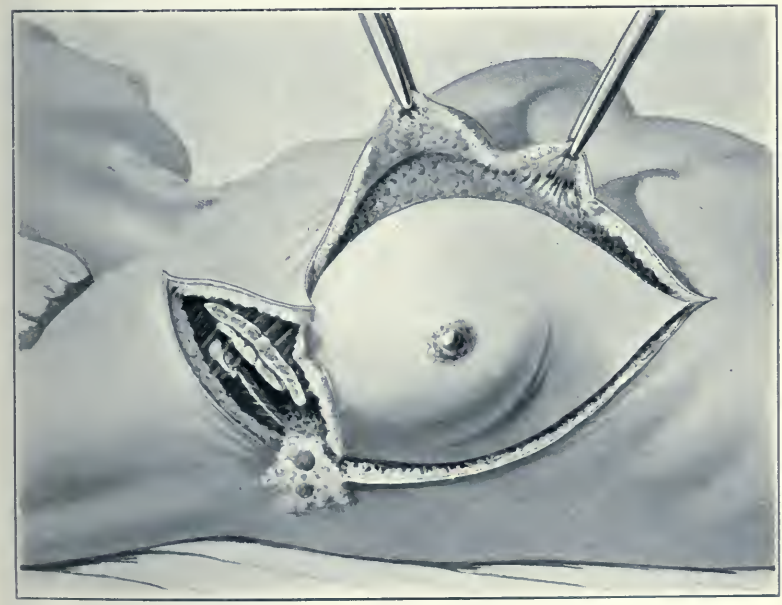

Fig. F.—Second skin incision. Observe the extensive undermining anteriorly

Fig. G.—Undermining inferiorly. Muscles, breast, and axillary mass being reflected prior to removal

Fig. H.—Appearance of the wound after removal of the breast, muscles, and axillary mass. A small part of the origin of pectoral muscles left as a covering for the ribs. This very much facilitates grafting, when necessary, which is rarely the case. In fourteen recent operations it has been necessary in only two cases

been attained. Under these conditions the breasts are apt to be the seat of inflammation, suppuration, and even sloughing, leading to septic infection. This is seen particularly in connection with pregnancy, and the record of these cases shows a very high mortality.

Diagnosis is easy unless the affection be confined to one breast; the possibility of a neoplasm being present must be borne in mind, and a condition resembling hypertrophy is simulated by a large retro-mammary lipoma. The most anxious cases are those associated with pregnancy, for not only do the breasts become extremely large, painful, and tense, but the patient may show signs of great weakness and emaciation. As abortion commonly takes place under these conditions with fatal results, and as the fœtus is ill-nourished and stunted, it would seem a clear indication to induce premature labour as soon as the hypertrophy becomes pronounced. When not associated with pregnancy, **Iodine** and **Thyroid Extract** have in some cases given good results, but as a rule removal is best when the size of the breasts causes any serious distress. It is better to remove one breast first, and the other later on, if it does not become smaller. Carcinoma is apt subsequently to develop in these hypertrophied breasts.

REFERENCE.—[1]*Edin. Med. Jour.* Dec. 1908.

BREAST, TUMOURS OF, IN CHILDHOOD.

Priestley Leech, M.D., F.R.C.S.

Jopson, Speese, and White,[1] in consequence of the occurrence in their practice of two cases of breast tumour in children, found on investigating the subject that there was an apparent lack of systematic papers on the subject. Tumours of the breast are rare in childhood; they occur, however, in both sexes and at all ages. The benign tumours are more frequent in childhood than the malignant. The fibro-epithelial growths are more numerous than the angiomata. Sarcoma of the mamma may occur in children, but it is a rare tumour. The breast enjoys almost complete immunity to carcinoma before the age of puberty. Girls are more frequently affected than boys, but the disparity in numbers is immensely less than in adults. The angiomata may be cutaneous, subcutaneous, or intramammary. The intramammary form is a true angioma of the breast; it may be diffuse or, less often, encapsulated. Both sexes are affected with equal frequency, the growths occurring either at birth or in the earliest months of life, and they may exist for years if not treated. The symptoms vary; at times an erectile tumour may be present which is painless and with the skin normal except for a few enlarged veins. Other cases may be cysts, caused by degeneration in the angioma. Small superficial angiomata may be destroyed by the cautery; the larger tumours situated in the gland proper require extirpation, and in some instances are of such size that complete removal of the breast may be necessary. The fibro-epithelial tumours may be classified as fibro-adenomata. A few cases of cystic disease and lipomata are on record. An analysis of 21 cases of benign tumours of the breast reported in

literature where the age was under sixteen gives the following results: 11 can be classified as fibromata or fibro-adenomata; the dividing line between these two, if there be one, is very indefinite. Of the remaining 10, 6 were angiomata, 1 fibrolipoma, 1 lipoma, 1 simple cyst, and in 1 case the diagnosis was not given. Fourteen were in females, 5 in males, and in 2 the sex was not stated. Angiomata were either congenital or appeared in infancy. Records of only three cancers of the breast in children can be found in literature, and these are doubtfully carcinomatous. Six cases of sarcomata are reported. The diagnosis is sometimes difficult between rapidly growing fibroma and sarcoma; it must be noted that the presence of enlarged veins over the breast is not conclusive evidence of malignancy.

TREATMENT.—**Operation** is usually indicated in the benign and always in the malignant varieties. In small benign tumours or those involving only limited areas conservative plastic operations with preservation of breast and nipple are indicated. The axilla must be cleared if it contains enlarged glands.

REFERENCE.—[1]*Ann. Surg.*

BRIGHT'S DISEASE. (*See* NEPHRITIS.)

BRONCHIECTASIS. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

The value of the continuous inhalation of **Oxygen** (Stoker's method) in the treatment of this troublesome disease is well shown by the case reported by Herringham.[1] The illness was of eighteen months' duration, and for many months the expectoration had been offensive, in amount averaging 8 to 12 oz. Continuous inhalation of oxygen for six hours daily by means of one of Dr. Stoker's bags was commenced on Nov. 9th. By the 13th the sputum was much less fœtid, and the amount was only 4 oz. By the 17th the amount had fallen to 3 oz; by the 24th to 2½ oz.; and by Dec. 4th to 2 oz., while the fœtor had disappeared. For purposes of comparison, the oxygen was discontinued on this date and creosote inhalation (carried out in the creosote chamber of the hospital) substituted. In a fortnight the sputa rose to 5 oz. per diem, and the fœtor reappeared. The oxygen treatment was then resumed, with the result that the daily average sank to 1 oz., with almost complete absence of fœtor.

REFERENCE.—[1]*Lancet*, Apr. 24, 1909.

BRONCHITIS, CHRONIC. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Forchheimer[1] points out that the treatment of this condition is too apt to degenerate into the routine administration of expectorants, insufficient attention being paid to its etiology, and therefore to efforts at cure. Among the *local* causes which tend to lead to chronic bronchitis, he lays stress on lesions of the nasopharynx and invasion by micro-organisms; among the *remote* causes, to diseases of the heart and kidneys, arteriosclerosis, and chronic intoxications, especially alcohol. In the first group, any condition that interferes with nasal breathing and the due filtration of the air respired should be removed.

Even where there is no obstruction, chronic nasal and pharyngeal catarrh may require treatment by nasal douching with indifferent solutions twice daily, for auto-infection by organisms from nasal discharge bears a large part in the production of bronchitis. Or these organisms again may have established themselves in the bronchial mucosa beyond the reach of douches. Inhalations and sprays, or intratracheal injections may then be tried; none of them, however, are very effectual, and they will probably give place in the future to treatment by vaccines.

In the second group of constitutional conditions, suitable general treatment should be adopted. Alcohol should be forbidden, and the hyperæmia arising from heart disease be met by cardiac stimulants. For the latter purpose, and for the prevention of the colds and chills, the repetition of which has so much to do with the production of chronic bronchitis, the writer advocates daily **Cold Douching.** The prolonged administration of the iodides, he believes, has an effect on the anatomical changes in the bronchial wall.

For the removal of the secretion from the tubes, he considers **Postural Treatment** the best means. The patient should therefore sleep with the foot of his bed raised—at first not more than two inches, but later this should be increased to four or five inches. Where this plan is followed, he says, there is less cough during the night, more sleep therefore, while even the morning cough is diminished and the expectoration lessened in amount.

Gymnastic Exercises, especially such as increase expiration, are important. During expiration, blood-pressure is increased, more blood flows into the right heart, stasis being removed, while expectoration is promoted. Full inspiration followed by full expiration may be practised. A greater effect is produced if, during inspiration, the arms are raised, while during expiration they are brought to the sides. To produce still greater effect, the lower part of the thorax should be compressed by the hands during expiration (Gerhardt's method). These exercises should be carried out in fresh air and at the normal rate of respiration.

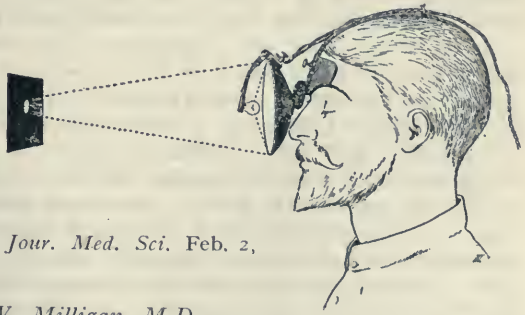

Fig. 9.

REFERENCE.—[1] *Amer. Jour. Med. Sci.* Feb. 2, 1909.

BRONCHO-ŒSOPHAGOSCOPY | *W. Milligan, M.D.* | *D. Lindley Sewell, M.B.*

Guisez[1] considers that illumination must always remain the delicate point in tracheobronchoscopy. To illuminate the bronchoscopic tubes he now uses a Clar's photophore (*Fig.* 9), and in order to collect

the rays of light a large detachable funnel is attached to the end of the tube. To facilitate the introduction of œsophageal tubes, a special mandrin, half rigid, half flexible, is employed (*Fig.* 10). The mandrin

Fig. 10.—Œsophagoscopic tube and mandrin with flexible end.

is made of metal as far as the lower extremity of the tube, while beyond this point it extends as a bougie of gum-elastic 10–12 cm. in length.

REFERENCE.—[1]*Jour. of Laryng.* July, 1909.

BRONCHOPNEUMONIA. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

The value of **Mustard Applications**, the **Pack,** or **Bath,** as first recommended by Heubner, of Berlin, is strongly upheld by E. Cautley,[1] Herzfeld,[2] and Stern.[3] Relief follows, even in desperate conditions of collapse and dyspnœa. Heubner's explanation is, that the hyperæmia of the skin opens up a new territory for the circulation, relieves the engorgement of the lungs, and hence increases the rapidity of the pulmonary circulation and reduces the work of the heart. His directions are as follows: A pound of mustard flour is added to a quart and a half of warm water, and stirred until the odour of mustard is perceptible. A towel is dipped therein, wrung out, and wrapped round the child from the shoulders to the feet, a woollen blanket being placed over the towel, and the neck well covered to prevent the mustard affecting the eyes and lungs. The child is kept in this dressing from ten to thirty minutes, or until the skin is red. It is washed with lukewarm water, and then bathed for five minutes in a lukewarm bath, after which a wet, warm towel is wrapped round the chest. The application may be repeated the next day.

A. A. Herzfeld[2] has introduced some slight modifications: 250 cc. (half a pint) of water and a similar quantity of alcohol are mixed in a bowl; to this is added from 25 to 55 cc. (1 to 2 fluid ounces), depending on the severity of the case, of freshly prepared spirit of mustard (oil of mustard 1 part, pure alcohol 49 parts). A large piece of flannel is well moistened with the mixture, and the body of the child wrapped up from the neck to the knees; over this is placed a dry sheet. The child is left in the pack until the skin is bright red, a point usually reached at the end of fifteen to thirty minutes; it is then taken out and wrapped for another half-hour in a pack moistened with alcohol 1 part, water 2 parts, after which it is wrapped up in a dry sheet. Under this treatment cyanosis disappears, dyspnœa is relieved, the pulse improves, and the mental condition brightens. Should a relapse occur, the treatment may be repeated, but it is not advisable, unless absolutely necessary, to give the pack more than once in 24 hours.

Cautley[1] prefers a temperature of 85° for the mustard bath. Usually, he says, these baths are given at too high a temperature, viz., at 100°, but the effect of the mustard is reduced by temperatures above 85°. In giving a mustard bath, the child is immersed up to the neck, the head being left free and the neck protected, so that the child does not inhale the mustard vapour. On being taken out, it is washed rapidly and well with water at a temperature of 90° to 95°, and wrapped in a warm blanket.

Cautley finds **Hydrotherapy**—both the hot and cold bath—of great value; a bath at a temperature of 90° to 95° may be given night and morning, or as often as every three hours if there is a temperature above 102°. In the treatment of very high fever, cold compresses can be applied to the chest every two hours, or a cold or tepid bath given, cold being applied to the head at the same time. He regards the **Open-air** treatment as extremely useful, but adds that by this is meant a free supply of pure air, the windows being kept open, but the atmosphere warmed by fires and the child protected from draughts; 60° to 65° is an appropriate temperature for the room, or in the case of a weakly infant 65° to 70°. The steam-kettle he reserves for cases in which the atmosphere is dry, and the cough hard and dry. As regards diet, he cautions against over-feeding on account of the gastric distention set up.

Drugs.—In the early stages **Belladonna** is useful on account of its power of reducing bronchial spasm and lessening secretion. Depressant drugs such as aconite or antimony should be avoided. **Ammonium Carbonate** is of great value, but is usually given in insufficient doses; a dose of a grain is not excessive (Cautley) even for an infant of six months. **Squills**, from its power over the heart, is also most valuable.

REFERENCES.—[1]*Med. Press*, June 16, 1909; [2]*Jour. Amer. Med. Assoc.* Jan. 9, 1909; [3]*Ibid*, Jan. 30, 1909.

BULBAR PALSY.

(*Vol.* 1909, *p.* 182)—Little and Bokenham record a case in which benefit followed **Ionization** with sodium and lithium salts, iodides, and salicyl compounds.

BURNS. *E. Graham Little, M.D., F.R.C.P.*

Martin[1] recommends the following treatment: Sterile gauze, soaked in a solution of **Picric Acid** (1 dr. to 16 oz.) in sterile water is applied directly to the burned surface, covered with rubber tissue and cotton-wool, and bandaged over. After forty-eight hours the dressing is removed unless infection has occurred; in the latter event, the surface is washed over with a solution of 10 gr. potass permanganate in 32 oz. sterile water. The picric acid dressing is repeated daily until the injured surface looks dry, when it is dusted over with zinc oxide, and left exposed to the air. The yellow stain produced by the use of picric acid may be removed by washing the hands in weak ammonia-water, and then applying a pure solution of hydrogen peroxide on cotton-wool.

Pels-Lensden[2] recommends the exhibition of **Digitalis** and large

quantities of fluid, to combat the initial shock: Strong coffee, tea, brandy, champagne, repeated enemata of physiological saline, or intravenous injection, may be required. **Morphine** is usually necessary. Local measures should not be commenced until thorough disinfection of the wound has been made under a general or local anæsthetic. The vesicles and bullæ are opened, the surface is scrubbed with hot water, and soap applied with a sterile brush. **Alcohol** and **Perchloride of Mercury** solution is applied for two minutes; and lastly, the wound is covered with a thick gauze dressing and then with absorbent wool. The latter must be changed from time to time, but the gauze left *in situ*. After ten to fourteen days the whole dressing is spontaneously shed. Early injections of **Thiosinamine** or **Fibrolysin** may be useful in obviating contractions in scarring.

REFERENCES.—[1]*Lancet*, Oct. 3, 1908; [2]*Deut. med. Woch.* Nov. 26, 1908, in *Brit. Med. Jour.* Feb. 6, 1909.

CACHEXIAL FEVER. (*See* LEISHMANIASIS.)

CAISSON DISEASE. *Purves Stewart, M.D., F.R.C.P.*

Compressed air does not usually cause symptoms until the pressure within the caisson rises to two atmospheres or more. The higher the air-pressure, the shorter is the time that workmen can remain with safety in the caisson. The symptoms of caisson disease are produced, not on entering the caisson, but during or after the period of decompression, if the patient passes too rapidly from an increased to a lighter atmospheric pressure. With the object of preventing caisson disease, all caissons nowadays have an air-tight decompression chamber attached, in which the atmospheric pressure is gradually lowered to normal, the process of decompression lasting for various periods according to the density of the atmosphere in the caisson.

Most of the symptoms of caisson disease are referable to the nervous system. They are produced by the development of bubbles of air within the arterioles or capillaries, consequent on too sudden relief of air-pressure. During the time spent within the caisson, the blood takes into solution an excessive amount of air, and if the air-pressure be suddenly relieved, the excess of air can no longer be held in solution, but forms bubbles, which block the blood-vessels, forming emboli, with consequent vascular stasis. As a result, the tissues, especially those of the central nervous system, have their nutrition at once interfered with, temporarily or permanently, according to the damage produced.

Allen Starr,[1] in an interesting analysis of over three hundred cases occurring in New York, gives the following list of symptoms in their order of frequency: (1) Myalgia or muscular pains, colloquially known amongst workmen as "the bends," especially affecting the spinal muscles and the muscles of the lower limbs. It occurred in 105 cases out of 310; (2) Aural symptoms (in 68 cases); (3) Joint pains (in 60 cases); (4) Acute paraplegia (in 26 cases); (5) Cerebral monoplegia (in 17 cases); (6) Intense cerebellar vertigo (in 14 cases); (7) Cardiac failure and dyspnœa (in 13 cases); (8) Aphasia, in a number of cases

All these phenomena present clinical pictures identical with those which result from ordinary vascular lesions, but their prognosis is much better, inasmuch as if the patient be replaced in an air-chamber, and its atmosphere be recompressed to two or three atmospheres, keeping him in that pressure for several hours, the air-bubbles may be reabsorbed into the blood, and the symptoms pass off. The air-pressure is then gradually reduced again to the normal. Such a patient when brought into the recompression chamber, if still able to walk, is encouraged to do so all the time. Signs of improvement, according to Ryan,[2] usually appear within fifteen or twenty minutes. If there has been delay in admitting the patient to the compression chamber, recovery is less likely, but massage of the limbs should be performed, and the patient encouraged to use the affected limbs. If recompression produces no improvement, the prognosis is bad, inasmuch as it is evident that the air-embolism has been followed by areas of infarction.

No other treatment is to be compared with that of recompression followed by gradual decompression. After a patient has developed signs of permanent organic lesion, he must be treated on ordinary lines by means of **Massage, Electricity, Strychnine, Hot Baths,** etc.

A severe attack of caisson disease, even if recovered from, should be a warning to the patient not to re-engage in caisson work. Slight attacks, consisting in mere myalgia, are liable to occur in beginners, or in careless employees, who neglect the customary decompression precautions which are demanded. Such slight attacks need not prevent a man from returning to work under suitable precautions.

REFERENCES.—[1]*Med. Rec.* June 19, 1909 ; [2]*N. Y. Med. Jour.* July 31, 1909.

CANCER.

W. Sampson Handley, M.S., F.R.C.S.

ETIOLOGY.

Radio-activity and Cancer.—Lazarus-Barlow,[1] in his Croonian lectures before the Royal College of Physicians, described numerous experiments with carcinomatous and other tissues and substances, to determine, if possible, whether the ultimate cause of the disease is radio-activity, as the occurrence of X-ray carcinoma of the hand would seem to suggest. He found that many substances (liver, kidney, cholesterin, gall-stone, carcinoma) affect a photographic plate in the dark (skotograph) like known radio-active substances and X rays, and also influence the rate of discharge of electricity in an electroscope. Nevertheless, such differences obtain that he could not conclude definitely that the animal substances under examination are radio-active, at least in the present sense of the term. He found, however, that there was a great resemblance between their action on the development of the ova of *Ascaris megalocephala* and the action of radium, uranium, thorium, and X rays. Reviewing many facts concerning carcinoma that had been studied in the Cancer Research Laboratories of the Middlesex Hospital, he suggested that radio-activity offers a reasonable explanation for them. Researches on the above lines

are proceeding, but owing to the complexity of the subject it will be some time before the question is finally settled.

The Connective Tissues in Cancer.—Victor Bonney[2] has made investigations on the condition of the connective tissues in carcinoma and in precarcinomatous conditions, and has reached important conclusions. He finds that the onset of a carcinoma is constantly preceded by certain chronic inflammatory changes in the underlying connective tissues, and by epithelial hypertrophy. The principal connective-tissue changes consist in increased cellularity, in the advent of bodies of " plasma cells " to the affected area, and in the disappearance of its elastic tissue. The downgrowth of the epithelial cells appears thereby to be facilitated. Similar precarcinomatous changes occur in the lymphatic glands before cancer cells appear within them.

Skin-parasites and Carcinoma.—M. Borrel,[3] of Paris, well known for his work on the " epithelioses,"—benign epithelial proliferations produced by the action of parasites—has observed the frequent presence of an acarus, probably the *Demodex folliculorum*, in malignant tumours arising in connection with the skin of the face and in Paget's disease of the breast. The idea which he tentatively puts forward is that parasites such as the demodex, or other parasites affecting the exterior or the interior of the body, may carry the hypothetical cancer virus into a favourable position where it is able to act upon the " receptive cells," cells of the body which have undergone some change which predisposes them to initiate a cancerous growth.

Borrel also states that he has demonstrated the presence of acari in the initial nodules of the infectious lymphosarcoma of dogs, first described in this country by Goodall and Washbourn. In the healthy mouse, Borrel has never met with acari in the sebaceous glands, but he has found these parasites in limited areas of the skin of cancerous mice, especially about the nipple. He suggests that a solution here presents itself for the development of cancer in several mice living in the same cage, and similarly for the persistence of cancer in one house or in one family, some parasite being the agent of transmission.

Borrel admits that the skin of the face is infested by demodex in about 50 per cent of all persons, but in healthy skin he has never found the parasites so numerous as in the early epitheliomas of the face upon the examination of which his paper is chiefly based. The facts recorded by M. Borrel may be implicitly accepted, though his inferences from them are certain to arouse scepticism.

Trauma in relation to Malignant Tumours.—Bland-Sutton[4] points out that the question of the part played by injury in the causation of malignant tumours possesses much medico-legal importance in view of recent legislation. In at least one case damages have been recovered for a malignant tumour attributed to bodily injury sustained in the course of employment. Mr. Bland-Sutton's wide experience lends great weight to his conclusions, which are as follows: A single " intensive " injury may occasionally induce the growth of a sarcomatous tumour. Sarcomata following a single definite injury are

most frequently seen in the long bones of the limbs, occasionally in the breast. So far as carcinoma is concerned, trauma as an etiological factor has only been seriously advanced in the case of the breast. In regard to carcinoma of the breast, all surgeons of experience admit that there is a definite history of mechanical injury in about 10 per cent of the patients. They are very careful not to express a definite opinion as to the causal relationship of such injuries to the formation of cancer. There is also a paucity of published statements from surgeons of great experience affirming trauma as a cause of mammary cancer. In order to be classed as of traumatic origin, a tumour must arise (1) at the site of injury, and (2) within a limited period after the injury; but no general agreement exists as to the time which may elapse before the tumour shows itself.

The Increase of Cancer.—Orth,[5] discussing the question of the increase of cancer, submits his statistics for five years at the Charité Krankenhaus in Berlin. The percentage of cancer necropsies to all necropsies between 1904 and 1908 varied from 10 to 14, and for five years averaged about 12 per cent. He compares this figure with the corresponding one from the same hospital in the years 1875–1885. During this period cancer provided only 6·6 per cent of the total number of necropsies. This author cautiously points out the fallacies which must be allowed for in these striking figures and in similar statistics. Among the factors which may vary the composition of the mass of patients attending a hospital are (1) The establishment of a new hospital in the neighbourhood; (2) The exclusion of certain diseases formerly admitted, e.g., typhus and typhoid; (3) The increase of cancer operations; (4) The establishment of a special cancer department, etc. But the figures seem to indicate a very decided increase in the disease, even when such fallacies are fully allowed for. Orth gives a pointed illustration of the uselessness of vital statistics not based upon necropsies, by quoting the Registrar-General's report for 1897, in which "cancer of the liver" is stated to be responsible for nearly 14 per cent of all the deaths from cancer. Orth's dead-house experience gives a frequency of ·2 per cent for primary cancer of the liver. It is evident that indubitable statistics on the incidence of cancer can only be obtained when burial without previous necropsy is made illegal.

W. C. Bentall[6] has studied the incidence of cancer in Travancore, S. India, where 1700 cases have come under observation in the last five years. The age of maximum frequency is between 36 and 45, while in England it is from 56 to 65, according to the statistics of the Imperial Cancer Research Fund. Cancer of the buccal mucous membrane is very common in both sexes, forming nearly 35 per cent of all cases seen. It is due to the habit of chewing the betel nut, which is used combined with areca nut, slaked lime, and tobacco.

Cancer Houses.—J. R. Leeson[7] has shown that of 248 deaths from cancer occurring in Twickenham during 21 years, all but four occurred in different houses, thus affording no evidence of any localized factor.

Heredity.—Ledoux-Lebard[8] has studied the question of heredity in cancer with special reference to the town of Havre. He states that of 117 patients suffering from any disease whatever, 22 have a family history of cancer—that is, 18·8 per cent. Of 42 patients with cancer, 7 had a family history of cancer, i.e., 16·6 per cent. He concludes that these figures are unfavourable to the theory of heredity in cancer. In regard to the striking family histories in which a number of members of the same family have suffered from cancer, he considers that the problem is too much bound up with that of cancer houses and districts to be susceptible of immediate solution.

In the discussion on this paper, Béclere pointed out, as against the doctrine of heredity in cancer, that before the discovery of the bacillus of tuberculosis, statistics were brought forward to prove that tuberculosis was non-parasitic, non-contagious, diathetic, and hereditary.

Contributions to the discussion as to the extrinsic (parasitic) or the intrinsic origin of cancer have recently been made by D. A. Welsh,[9] of Sydney, and A. T. Brand.[10]

Pathology.

C. Powell White[11] has published some lectures on the pathology of cancer which present a concise and closely reasoned summary of the general aspects of the cancer problem. Their perusal is to be strongly recommended; as giving within a narrow compass a bird's-eye view of the subject, stripped of loose verbiage. Dr. White considers that a tumour arises from the removal of the normal checks upon the inherent proliferative tendencies of the cells of the body, and gives cogent reasons for rejecting the parasitic theory. The cancer cell is a normal cell, save that it has escaped from the control of the organism. Its metabolism is probably the same as that of the cells from which it arose. In this respect Dr. Powell White enforces the present writer's conclusion in 1906, that " in the close affinity which appears to exist between a cancer cell and the normal epithelial cell, lies probably the chief difficulty of the cancer problem, since the discovery of a selective poison for cancerous epithelium is thereby rendered most unlikely."

Powell White, using polarized light, has detected certain crystals containing cholesterin and fatty acids in the cells of malignant new growths. Cholesterin, according to his observations, is normally present in, and indeed is secreted by, the cortex of the adrenal body, and he believes that, both in normal and in cancerous tissues, it plays an important part in the regulation of cell-proliferation.

G. Lenthal Cheatle,[12] in cases of cutaneous cancer, has observed inflammatory changes in the posterior-root ganglia, corresponding to the area in which the growth arose, while the root ganglia of the areas to which the cancer subsequently extended showed degenerative changes. The same observer has continued his observations on the relation of the areas of extension in cancer to cutaneous nerve areas.

Cecil W. Rowntree,[13] in the Hunterian Lecture on X-ray carcinoma, has collected eleven cases of this disease in England, only one of which

was fatal. He states that the microscopic appearances of an X-ray growth are those of an ordinary squamous-celled carcinoma. The growth begins in an X-ray burn, which leaves a chronic, warty dermatitis. Sooner or later one of the warts becomes larger, and increasingly painful. A small ulcer forms at the base of the wart, the extension of which causes the wart to fall off, leaving a gradually extending malignant ulcer. In nearly half the cases the malignant growths are multiple. Rowntree finds a close resemblance between X-ray dermatitis and xeroderma pigmentosum, a condition due to exposure to light, and frequently ending in multiple malignant growths of the skin. Prof. Rowntree investigated histologically the effect of X rays on the skin of the rat's tail. As regards the connective tissues, he found thickening of the walls of the small vessels, with diminution of their lumen and disappearance of the elastic tissue, accompanied by increased cellularity. Lastly, a tissue like scar-tissue, poor in wandering cells, is left. As regards the epithelium, large doses caused necrosis and detachment of the epidermis, with complete destruction of the hair follicles and the sebaceous glands. Smaller doses, on the contrary, produced hypertrophy of the epidermis and of the hair follicles. Rowntree considers it possible that a dose of X rays just sufficient to excite retrogression in the superficial parts of a growth may, in the deeper portions, stimulate to increased activity.

Bland-Sutton[14] has come to the conclusion that the bilateral carcinomata of the ovary which are not infrequently met with are usually secondary to some growth arising in one or other of the abdominal viscera. The cancer-particles fall into the pelvis and implant themselves on the ovaries. In such cases a careful search should be made for the primary growth.

Natural Processes of Cure in Cancer.—Prof. Reclus,[15] in a lecture on the prognosis of cancer, spoke as follows on its medicinal therapeutics: "For the last fifteen or twenty years, new treatments have seen the light almost every day, amongst which may be mentioned, radium-therapy, radio-therapy, currents of high frequency, salts of soda, potash, quinine, and numerous analogous preparations, as well as an infinite number of serums. Strange to say, every one of these methods appeared, at the beginning at least, to produce, if not always a cure, at least considerable improvement. Surgeons of all countries rushed to these vaunted remedies, but less than a decade sufficed to undeceive the most sanguine. At first it seems difficult to explain how men of science could have allowed themselves to be enticed by these deceptive discoveries, and to publish some ephemeral successes. But it must not be forgotten that those affected with cancer are patients treated without much conviction, and frequently abandoned to morphia. Suddenly a saviour appears and communicates his confidence; hope revives with the desire to live, sleep returns, appetite and strength increase, and both patient and surgeon are carried away by enthusiasm, and end by proclaiming as incontestable, imaginary cures. But the true source of our errors lies in our ignorance of the progress and development of cancer."

The present writer, in a Hunterian Lecture on "The Natural Cure of Cancer,"[16] has made a study of the natural processes of cure which show themselves in untreated carcinoma. These phenomena, in his opinion, sufficiently account for the favourable, but always temporary, results which have been so frequently recorded in the medicinal and physical therapeutics of cancer. The only remedies which have been shown by reasonable evidence to possess any power against cancer are X rays, radium, and Coley's fluid. The action of the first two is purely local, while Coley's fluid is only effective against sarcoma, and in a small percentage (perhaps 10 per cent) of cases.

The natural history of cancer, in accordance with the permeation theory of dissemination, is one of centrifugal growth, followed by centrifugal death. The process of perilymphatic fibrosis, which destroys a permeated lymphatic, and leaves only a fibrous cord to represent it, is paralleled on a large scale by similar fibrotic processes, which start in the centre of the macroscopic nodules and spread slowly to their

DESCRIPTION OF PLATE XXXII.

Figs. A and *B* are schematic representations of two stages in the life-history of a carcinoma. The lymphatic plexus, H, and the microscopic regions of the carcinoma, are represented as highly magnified, while the primary growth and its naked-eye secondary nodules are reduced in size. Active cancer tissue is coloured blue, dying or extinct cancer tissue and fibrosed lymphatic vessels are coloured white.

Fig. A.—A Carcinoma in the Evolutionary stage. The active primary growth, A, is surrounded by secondary nodules, B, and by smaller and younger secondary nodules, C. The circle F is an imaginary line, separating the clinically appreciable region of the carcinoma from the outlying microscopic region, in which is found G, the microscopic growing edge of permeated lymphatics. Beyond G is the normal lymphatic plexus, H, while inside G the vessels of the lymphatic plexus, represented as thin white lines, have been destroyed and converted into fibrous threads.

Fig. B.—A Carcinoma in the Involutionary stage. The primary growth, A, and the oldest secondary nodules, B, have now become completely fibrotic and inactive, and are represented by puckered scars. Fresh nodules, D, and others, E, still younger and more remote, have made their appearance in the rear of the microscopic growing edge, G, which, continuing to spread, has now attained a very large diameter, and is still advancing into hitherto intact regions of the lymphatic plexus, H. Within G all the lymphatic vessels have been converted into fibrous threads. Other letters as before.

circumference. But, at the periphery, the growing edge of permeation continues to advance, and to produce fresh satellite-nodules which ultimately cause the death of the patient (*Plate XXXII*). Thus the natural cure of cancer is always going on, but since it is a local, not a constitutional process, it is accompanied by further active spread of the disease in other regions further removed from the primary focus. The early hope and the ultimate disappointment associated with cancer remedies thus find an explanation. It may be stated as a law of cancerous growth hitherto unrecognized that :—

Every aggregation of cancer-cells has a definite life-cycle, and after increasing in size for a varying period and at a varying rate, tends spontaneously to undergo degenerative and fibrotic changes. These changes extend from the centre of the mass centrifugally to its periphery, lead to its shrinkage, and terminate in the replacement of the aggregation of cancer-cells by a fibrous scar.

How, then, can the power of cancer remedies be measured save by complete cure ? This is possible in certain cases of abdominal cancer,

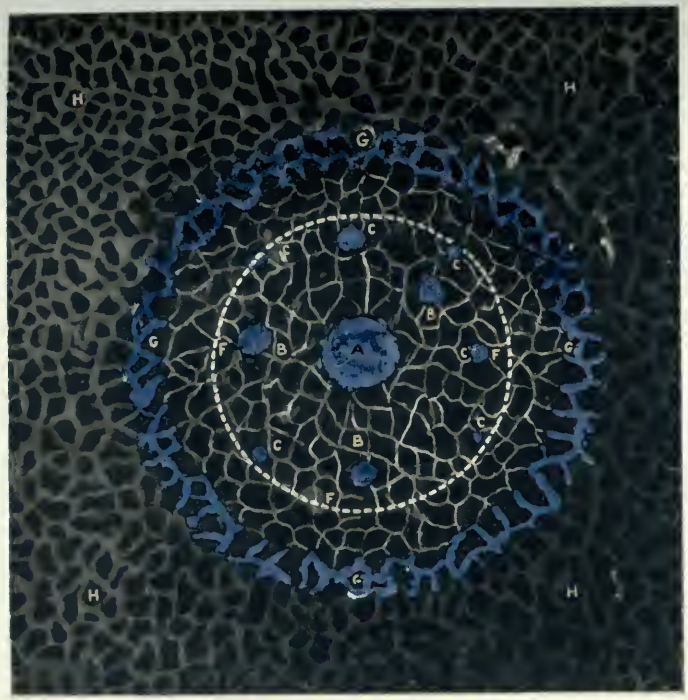

Fig. A.—A carcinoma in the evolutionary stage

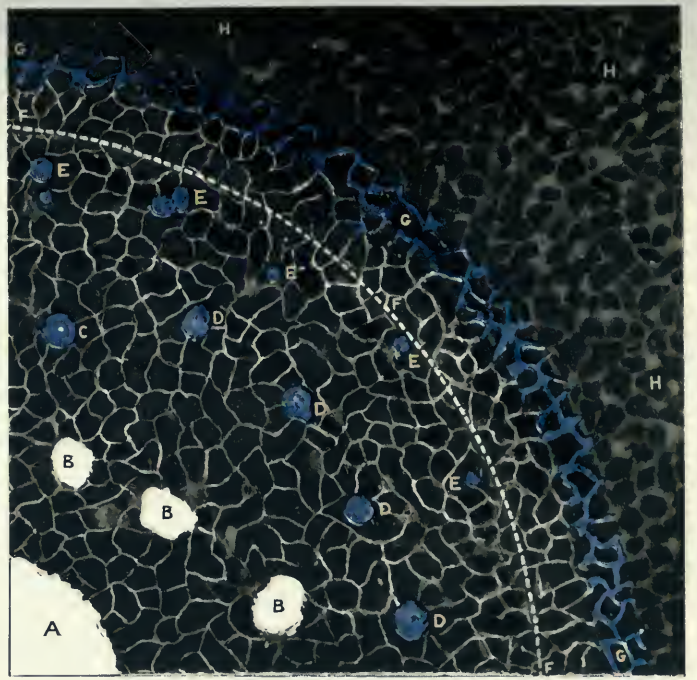

Fig. B.—A carcinoma in the involutionary stage

W. Sampson Handley

where a crop of skin-nodules spreads centrifugally from the umbilicus in a continually widening circle. Local remedies such as X rays could, with the consent of the patient, be applied to one half of the abdomen in such cases, the other half remaining untreated as a control. The effect of constitutional remedies could be estimated by noting if they arrested the further spread of the nodules. In some such way a basis of scientific precision might be given to the therapeutics of cancer. It is thus to be noted that the disappearance of existing nodules, as distinguished from the failure of fresh ones to appear, is of no value as a therapeutic test. (*See Figs.* 11 *and* 12.)

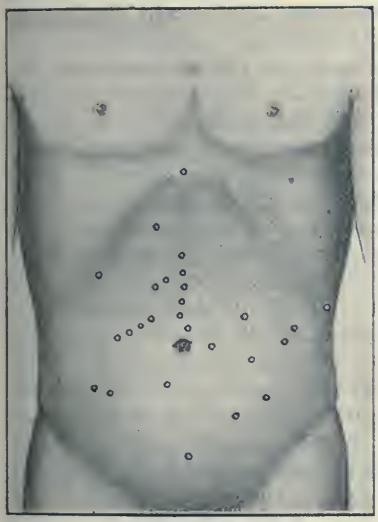

Fig. 11.—A chart of the subcutaneous nodules, spreading from a point just above the umbilicus, present in a case of stomach cancer one month before death.

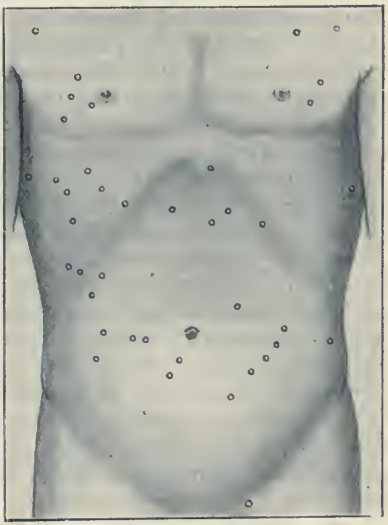

Fig. 12.—A chart showing the same case at the time of death. The nodules have continued to spread, but they have vanished from the region where they made their first appearance.

H. Gideon Wells[17] also believes that therapeutic progress in cancer is most likely to be made by a study of the natural defences of the body against it. He quotes many interesting cases illustrating repair in cancer, from which the following, recorded by Petersen and Colmers, may be selected. A colloid carcinoma of the pylorus was resected, but several cancerous glands were left along the lesser curvature; that they were cancerous was shown by the histological examination of other glands removed from this situation. Three years later the patient was operated upon for umbilical hernia, and examination of the stomach showed no sign of local recurrence or of cancerous glands. Six months later the patient died from intestinal obstruction, and at the necropsy deposits of cancer were found only within a uterine myoma and in the sigmoid flexure. No cancerous glands were present, nor was there any recurrence in the stomach. Another

interesting case quoted is Jacobsthal's, of a patient with carcinomatous submaxillary glands, but with nothing to represent a primary growth except a healed scar upon the lower lip where an ulcer had been present six months previously. A similar case is quoted from Freeman. Many other interesting cases of natural repair are quoted in the paper.

One of the most striking instances of natural cure is that of Bruce Clarke,[18] who, in a lecture on the arrest of cancerous growths, has recorded a case of a large retro-mesenteric swelling as big as a fœtal head in a man aged 50. The abdomen was opened, and removal of the tumour was found to be impossible. Enlarged glands were present, and one removed for examination showed typical columnar-celled carcinoma. Subsequently the growth shrank and disappeared. Twelve years later, the patient was shown in perfect health.

Mouse-cancer.—The literature connected with mouse-cancer has become so voluminous that no full account of it can be compressed into the limits of a short article. Recent work has been directed mainly towards the subject of immunity, and some amount of success has been obtained. The reader who wishes to pursue the subject will find the latest results detailed in the magnificently-illustrated Third Scientific Report of the Imperial Cancer Research Fund.

Ehrlich,[19] in attempting to achieve immunity in mouse-cancer, has considered the cancer cell as if it were a bacterium, and applied methods taken from bacteriology. He found that inoculation of a mouse with an avirulent carcinoma usually protects it against subsequent inoculation with a virulent growth. A mouse-tumour implanted into a rat grows for about a week and then withers. Ehrlich believes that within this time the growing tumour exhausts the rat's supply of some substance necessary to the further growth of the tumour. To the immunity thus produced he applies the name "atreptic immunity." When a tumour is growing rapidly in an animal, a second implantation of the same tumour usually fails to "take," for the same reason. This latter observation does not accord with the experience of Bashford, nor with the clinical facts of human carcinoma.

Bashford, Murray, and Cramer,[20] in a study of natural and induced resistance to mouse-cancer, after discussing the differences between spontaneous and implanted tumours in the mouse, point out the importance, with reference to immunity, of natural variations in the resistance of mice to inoculation, and of inherent variations in the energy of growth of the tumour cells. Their main conclusions are: (1) Mice in which a growing tumour has been spontaneously absorbed may be completely protected against subsequent inoculation of the same growth, and to a lesser extent against other and different growths. Similarly, protection follows absorption of tumours after exposure to radium. (2) In cases where tumour-inoculation has failed, protection may be induced, or when naturally present enhanced, by the unsuccessful inoculation. The protection is not obtained by inoculation with tumour tissue derived from an animal of another species. (3) Protection

can also be induced by the inoculation of normal mouse tissues, and particularly by the inoculation of blood.

Haaland,[21] in the laboratories of the Imperial Cancer Research Fund, has confirmed Ehrlich's observation that an implanted mouse-carcinoma may give rise to a sarcoma. He has shown that the sarcoma arises from the tissues of the host, owing to a malignant change in the stroma formed by the host to nourish the implanted graft, and has made a close study of this remarkable process in all its stages, from the earliest to the latest. His paper is fully illustrated by drawings. It should be carefully noted that, according to Haaland, the sarcoma does not arise from the metamorphosis of carcinomatous tissue.

W. H. Bowen[22] has investigated the effect of ligaturing the vessels supplying the tumour in cases of mouse-cancer. He finds that complete obliteration of the blood-supply brings about sphacelation and cure, but that complete obliteration cannot be attained if infiltration has commenced. When there is a natural tendency to spontaneous cure, the disappearance of a tumour may be hastened by partial obliteration of the vessels which supply it. But such partial obliteration does not, as a rule, permanently arrest the growth of a tumour, even though it brings about a temporary diminution in its size. These observations are interesting in connection with the practice of ligaturing the vessels in irremovable human malignant growths. The present writer some years ago succeeded in curing an angiosarcoma of the broad ligament by tying the ovarian and uterine arteries on the affected side.

Sticker[23] states that he has repeatedly cured the infectious lymphosarcoma of dogs by injecting every eighth day ·01 cgram of atoxyl and 10 to 15 cc. of the blood of an animal of another species. Neither the atoxyl nor the foreign blood, used separately, effected a cure. Experiments with the method in human cancer are to be made. [The present writer, several years ago, tried the injection of horse-serum in two cases of human carcinoma, with a negative result except for temporary relief of pain.]

W. Ford Robertson[24] fed thirty mice with pleural fluid from a case of malignant pleurisy in the human subject. The fluid had been incubated at 37° C. for seven weeks. Within fou teen months seven of the mice developed carcinomatous tumours, three in the breast, two in the lung, one in the testicle, and one in the uterus. A mouse, born in the cage during the course of the experiment, also developed a large carcinoma of the breast which caused its death. Photomicrographs of the growths are given, which are convincing as to the malignant nature of the tumours produced. But in view of the facts of "cage-infection," these experiments, so contrary to the usual experience in similar investigations, require repetition and confirmation. Dr. Ford Robertson believes that he has detected a group of protozoa associated with the growth of malignant tumours.

Diagnosis.

Gastric Acidity in Stomach Cancer.—Continuing the work of Golding Bird and B. Moore, F. W. M. Palmer,[25] investigating thirteen cases of

cancer in organs other than the stomach, found that two showed normal acidity, while the remaining eleven exhibited a much lowered acidity, varying from 1 to 15 per cent of the normal. They believe that, while a much lowered acidity points to cancer, it does not definitely indicate cancer of the stomach. A much lowered acidity may, however, be found in non-cancerous conditions.

Friedenwald and Rosenthal,[26] in a similar investigation, reach similar conclusions. They find that surgical removal of the growth does not restore to the gastric juice its lost acidity.

Copeman and Hake[27] carried out a prolonged series of experiments on the gastric juice of cancerous mice, and found that the free hydrochloric acid was rather increased than diminished. They correlate this fact with Bashford's observation that cachexia rarely occurs in mouse-cancer.

Microscopy during Operation.—In suspected cases of carcinoma, where a small piece of the doubtful tissue is excised for examination, A. Leitch[28] (Dundee) advocates a rapid method of histological examination requiring only seven minutes. A thin slice of the excised tissue is thrown into acetone, then into hot water, is surrounded by gum, frozen, cut, and stained with an acetone solution of krystall-violet.

Brieger's Reaction.—In 1906 Jochmann and Müller showed that leucocytes contain a proteolytic ferment, while the blood-serum contains an antitryptic ferment which hinders or prevents the proteolytic action of the leucocytes. Brieger found this antitryptic ferment of serum very frequently increased in patients with carcinoma, and he hoped this fact would prove of assistance in diagnosis. Further research has shown that the reaction is not specific to carcinoma, and that it is accordingly of little use. It occurs very frequently in other conditions of cachexia, such as phthisis, diabetes, and exophthalmic goitre (Herzfeld,[29] Treburg,[30] Bergmann and Meyer[31]). E. C. Hort[32] has described a simple method of measuring the antitryptic power of serum by an estimation of the amino-acids formed in tryptic digestion.

Dr. Elsie M. Royle,[33] in a striking paper which embodies much careful work, has shown that in malignant disease there is a marked diminution in the excretion of phosphates by the kidney. The diminution is not merely an absolute one, such as might be accounted for by a general diminution of metabolic activity, for the ratio of the phosphates to the uric acid is diminished.

Treatment.

The Necessity of Early Operation.—C. P. Childe[34] insists that further improvement in the results of operations for cancer is chiefly to be looked for in the systematic education of the public. It should be taught (1) That early cancer is curable by operation; (2) That early cancer produces no symptoms of pain or ill-health. In the latter half of life any deviation from the normal in certain organs—to wit, the mouth, digestive tract, uterus, and breast—should lead the patient

to consult a medical man. On the side of the medical man, doubts should be resolved and delay avoided by histological examination, wherever possible, of an excised portion of the tumour, since the clinical signs of cancer become manifest only in a late stage of the disease. In doubtful abdominal cases an exploratory laparotomy may be necessary. Childe rightly urges that it is better to confess doubt than to pretend to omniscience, and believes that the public are able to appreciate frank statements of the defects in our knowledge.

Implantation during Operation.—Chas. Ryall[35] has drawn attention to the danger of implanting cancer-cells in the tissues during surgical operations, especially in the needle punctures made while suturing the wound. He gives details of the operative precautions necessary to prevent this accident. C. Mansell Moullin[36] believes that in such cases cancer-cells are widely distributed in the tissues, and that the irritation of the suture lowers tissue-vitality sufficiently to allow the cancer-cells to proliferate.

In order to prevent cancer-implantation during operation, E. A. Babler, St. Louis,[37] recommends the application of **Harrington's Solution** (alcohol-bichloride-hydrochloric acid solution) to the exposed surfaces before suture. Primary union is not interfered with. Some surgeons will prefer to use a weaker antiseptic for the purpose, and for some years I have employed with satisfactory results 1–1000 **Bichloride of Mercury,** followed when convalescence is complete, by a prophylactic course of **X Rays.** Crile X-rays the wound area daily for a fortnight before suturing it, with the same idea, but this plan has obvious disadvantages, and appears to be quite unnecessary.

The Prophylactic Use of X Rays.—The use of X rays as a prophylactic against recurrence after operations for external cancer is rapidly becoming general. Ennion G. Williams,[38] in advocating the use of X rays to guard against recurrence after the operation for breast-cancer, advises two or three short series of exposures, at intervals of a week or a fortnight. Each series should consist of an exposure, on three successive days, of ten to fifteen minutes' duration at ten-inch distance, the milliampèrage in the secondary being $\frac{3}{4}$ to 1, and the penetration of the tube on the Benoist scale 4 to 5. The series just about suffices to produce an erythema. Williams draws attention to the necessity for thus concentrating each dose of the rays within a short period of time, if the malignant cells are to be killed and not merely scotched.

Radium Treatment.—The use of radium for cancer has made little progress in England, owing to the difficulty and expense of obtaining an adequate supply. Radium, like X rays, appears to be effective in the treatment of some early and superficial malignant growths, while upon those more deeply seated its influence is slight or absent. It may promote the healing of the ulcerated primary growth in advanced cancer of the breast, as in a case recorded by Wickham, but its "success" in such cases can be paralleled among untreated cases of the same disease, and is very different from a cure. Dr. Wickham[39] has

successfully used radium in the treatment of nævi, eczema, keloid, and rodent ulcer. He encloses the radium in lead screens, to shut off the harmful effects of the less penetrating rays, which are apt to injure the skin. The superiority of radium to X rays in the treatment of cancer has not yet been proved, and neither method can be recommended as a substitute for operation, save in rare and exceptional cases, and in rodent ulcer. The claims which Dr. Louis Wickham makes for radium are as follows: (1) The treatment can be applied without inconvenience to the patient in his or her daily occupation. (2) The interposition of lead screens renders the action of the rays on tumours slow, and on healthy tissues harmless. (3) "Cross-fire" application compensates for the great diminution in radiations caused by lead filtration. (4) The radiations exert their special action at a depth. As regards cancer of the breast, radium can (*a*) Cause its retrogression to such a degree as to bring about the appearance of a cure; (*b*) Transform an inoperable into an operable cancer; (*c*) Act on recurrences of small dimensions following on operations; (*d*) Act on some cancerous lymphatic glands if not too extensively involved; (*e*) Prolong life in incurable cases by relief of pain and checking of hæmorrhage and cancerous discharges; and (*f*) Act as a prophylactic against recurrence after surgical intervention.

Action of Radium on the Tissues.—Delbet, Herrenschmidt, and Mocquot[40] introduced a silver tube of radium (5 cgrams of activity 2,000,000) into the stomach of dogs, and fixed it in position for twenty-four hours. Subsequently, at varying intervals, they investigated histologically the condition of the affected area of gastric mucous membrane. The action was confined rigidly to the mucosa in the immediate neighbourhood of the tube, the rest of the stomach being unaffected. Lesions first appear between the second and the fifth week after exposure. They extend in depth to the muscular layer, but this coat is only affected just where the radium exerts its maximum influence. The connective tissue of the mucosa and of the submucosa is stimulated, while the epithelial cells seem to offer little resistance, and rapidly perish. At the margin of the affected area, however, the epithelium, like the connective tissue, receives a nutritive stimulus. At the end of five weeks, signs of repair were manifest in the injured area, but the authors did not pursue their researches further. The most striking feature of their experiments is the limited range of action of the relatively large quantity of radium employed. It may perhaps be mentioned, as indicating the restrictions at present imposed on the use of radium, that the Paris Bank of Radium would charge 7s. 6d. per hour, or £9 per diem, for the hire of a tube like that employed in the foregoing experiments.

High-frequency Currents in the Treatment of Cancer.—Under the attractive name of **Fulguration,** Dr. de Keating-Hart, of Marseilles, has introduced in France a modification of the method of treating cancer by sparking from the terminal of a high-frequency apparatus upon the raw surface left after excision of the growth by the knife.

The method has attained a great vogue in France, but belief in it appears to be waning, while German workers, whose experience is shorter, are perhaps more favourably inclined to it. The method is not new in principle. Some years ago a similar mode of treatment was tried and abandoned in this country, after becoming the subject of a newspaper boom, and this is no doubt the reason why fulguration has failed to obtain a foothold in England. Unless and until French surgical opinion pronounces definitely in favour of the method, there appears to be no sufficient reasons for its adoption, or even for its trial, in surgical practice here.

The technique of de Keating-Hart may be studied in his paper in the proceedings of the French association for the study of cancer.[41] Horace Manders[42] may be referred to for details of the method, if French sources are not available.

Fulguration is said to cause a profuse exudation of serum from the surface to which it is applied, and some authors state that this exudation possesses a high toxicity. Consequently, if the excisions are sewn up, free drainage must be provided. Certain cases in which death, preceded by high fever, has occurred after fulguration operations, are attributed by some authorities to the absorption of this toxic serum, by others to the additional risks of sepsis associated with the process of fulguration. It is claimed that surfaces which have been submitted to fulguration undergo exceptionally rapid cicatrization and healing, and that islets of cancer cells may thus be strangled by a vigorous formation of young connective tissue around them.

It is worthy of note that de Keating-Hart has changed his ground in respect of the operative part of the procedure. He formerly advised, as a preliminary to fulguration, merely the excision of the macroscopic masses of growth. He now says, "The minimum of the surgical act should be enucleation at the boundary of the healthy tissue"; and some of his followers demand that fulguration should be preceded by the freest possible operation. It would appear, therefore, that the results of the earlier cases of fulguration have compelled increasing reliance upon the assistance of the knife.

Tuffier[43] has histologically investigated the mode of action of fulguration upon the tissues. The epithelial cells of healthy skin show no change after fulguration, but the superficial parts of the dermis show temporary œdema and congestion. There is no interference with the process of karyokinesis in the epithelial cells. Immediately after fulguration the cancerous epithelium shows no change, but the surrounding connective tissue appears distended by serous fluid, and its cells are swollen. These changes do not extend beyond a depth of 1·5 mm. ($\frac{1}{20}$ in.). The same tissue, examined eight days later, shows marked inflammatory hypertrophy of the superficial connective tissue. The intervening cancer cells remain intact and show karyokinetic figures. Beyond a depth of $\frac{1}{10}$ inch the tissues show no change. At the end of fifteen days the superficial layer consists of

adult fibrous tissue which is contracting upon and strangling the included epithelial cells to a depth of $\frac{1}{2}\frac{1}{5}$ inch. Tuffier has found exactly the same changes in a cancerous surface submitted to the action of hot air at a temperature of 300 to 400°. His researches show that fulguration acts as a superficial escharotic, having no selective action upon cancer cells. Delbet[44] considers that the evolution of fulguration bears an unhappy resemblance to that of other cancer treatments. He states that "Only a few months ago Dr. de Keating-Hart asked as a preliminary to fulguration only such a rough excision as would be manifestly insufficient without fulguration, while now he asks for an excision as wide and complete as possible. This implies the abandonment of the claim that fulguration can destroy cancerous masses. The only claim now left is that it retards or suppresses recurrence, a claim whose settlement will be difficult and tedious."

Inoperable Cancer.—Sir Henry Morris,[45] at the meeting of the International Society of Surgery (Brussels, 1908), dealt with the treatment of inoperable cancer. He mentioned the signal relief from the pain of lingual cancer which is afforded by division of the lingual nerves, and stated that ligation of both lingual or both external carotid arteries is followed by subsidence of œdema, diminution of salivation, and cessation of hæmorrhages. He advocated laying open large cystic glandular masses in the neck in cancer of the tongue, and swabbing the cavity with chloride of zinc. He considered that gastrostomy in cancer of the œsophagus is done too early and too often, and that it is rarely of advantage to the patient to prolong his life for a short period by performing the operation. Similar arguments, in his opinion, severely restricted the field for gastro-enterostomy in carcinoma of the pylorus. On the other hand, colotomy in rectal cancer might often with advantage be performed earlier than is at present the custom. Among palliative measures which may be of use in breast-cancer, Sir H. Morris mentions excision of the ulcerated breast, or curetting followed by the application of caustics, division of the brachial plexus, and division after laminectomy of the posterior spinal roots of the nerves for pressure-pain, and interscapulo-thoracic amputation and lymphangioplasty[46] for the œdematous arm.

Sir G. Beatson, quoted by Sir H. Morris, states that "**Oöphorectomy** for breast-cancer is a procedure that can be fairly put before the patient as having possible palliative effects that may carry with them improved health and prolonged life." Mr. Bruce Clarke[47] not long ago expressed an opinion favourable to oöphorectomy in breast-cancer: and a case of the present writer's, declared by a well-known surgeon to be inoperable, remains well more than three years after a combined operation for excision of the growth and oöphorectomy.

F. Hurst Maier[48] recommends the use of **Acetone** as a dehydrating and hardening agent in cases of inoperable uterine carcinoma. The method was first described by G. Gellhorn. Bleeding and discharge cease, and the appetite and general condition improve, while pain

remains unaffected. The growth is curetted under an anæsthetic, and the vagina is then flooded with acetone for fifteen minutes through a Ferguson's speculum. Subsequently, similar acetone applications are made thrice weekly without an anæsthetic. Similar effects may of course be attained by the cautery, or by the application of iodized phenol after curetting. The method might be tried upon septic cancerous ulcers in other situations, e.g., of the breast.

The Abuse of Morphia.—In an article on the treatment of inoperable cancer, W. Seaman Bainbridge,[49] of New York, has drawn attention to the widespread abuse of morphia. He says, "In many instances the patient is cachectic more from the locking up of the secretions by physical inactivity, by insufficient or improper food, and by morphine, than by the disease itself." "Promotion of the excretory functions, tonics, good food, plenty of air and sunshine, will do much to help such a patient."

Open-air Treatment.—The present writer[50] has advocated open-air treatment, carried out if possible on strict sanatorium lines, as probably the best means of checking the progress of the more chronic cases of inoperable cancer, and as the best safeguard, combined with X rays, against post-operative recurrence.

Trypsin in Carcinoma.—J. A. Shaw-Mackenzie,[51] who claims priority in the trypsin treatment for cancer, finds as the result of his experience "that while necrotic changes may be induced by injections of trypsin in the neighbourhood of the growth, this cannot be accepted as evidence of the successful treatment of cancer, while in some cases there appears to have been an advance of the disease rather than its retrocession." Experimenting on the treatment of cancerous mice with various ferment-containing extracts derived from organs, such as the intestine, liver and spleen, Shaw-Mackenzie obtained negative results. But still, in his opinion, it is too early to conclude that these results are condemnatory of the whole theory of intracellular ferment action and ferment treatment in carcinoma.

W. P. Graves in Boston,[52] and R. Morton and H. E. Jones[53] at the London Hospital, have expressed opinions that trypsin is useless, thus confirming the conclusions arrived at in the cancer wing of the Middlesex Hospital. The trypsin method has received a final and crushing blow from the results of a most careful and thorough investigation on a large series of cases of human cancer by W. Seaman Bainbridge,[54] of New York.

Among the substances which have been recently advocated as useful in the treatment of cancer are, cocaine, formalin, hypochlorite solutions given subcutaneously, potassium bichromate, and the serum of a horse suffering from cancer.

F. Gwyer[55] has tried thymus gland in cancer. A careful perusal of his cases leaves the impression that it is quite useless.

Coley's Fluid in Sarcoma.—The full account of Coley's treatment of sarcomata by mixed toxins which was given in the *Medical Annual* for 1907 would appear to have reawakened interest in the method

in Europe. Dr. Coley[56] has since recorded other cases of long-standing cure, for example: (1) A case of round-celled sarcoma of the back, three times recurrent; final disappearance of the tumour under toxin treatment, the case having now been well two and a half years. (2) Inter-scapulo-thoracic amputation for sarcoma of humerus, recurrence, disappearance under the mixed toxins. This case is a recent one. (3) Inoperable spindle-celled sarcoma of the abdominal wall and pelvis, treated by toxins, the patient remaining well fifteen years later.

Cases of sarcoma successfully treated by Coley's fluid have recently been recorded in England by W. C. G. Ashdowne[57] and W. G. Spencer.[58] Ashdowne's case, a sarcoma of the lower end of the humerus, is shown in *Plates XXXIII.* and *XXXIV.*

X Rays in Sarcoma.—G. E. Pfahler,[59] of Philadelphia, speaks very favourably of the results of treating sarcomata by X rays. He claims thirteen recoveries of a duration from some months to five years out of twenty-two cases, and considers that at least 25 per cent of cases of sarcoma will prove amenable to the method, as against the 11 per cent of cures claimed by Coley. If X rays seem slow in their action on the tumour, Coley's fluid should be used in addition, as was the case in some of Pfahler's cases.

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CATARACT. *A. Hugh Thompson, M.D.*

Senile Cataract.—The enormous number of cataracts with which Indian operators have to deal gives them a wealth of experience in this subject which must ensure them a respectful hearing. When

PLATE XXXIII

SARCOMA OF LOWER END OF HUMERUS

Treated with Coley's fluid

Before treatment

W. C. G. Ashdowne's case

SARCOMA OF HUMERUS

Treated with Coley's fluid

After treatment

W. C. G. Ashdowne's case

we are told of a surgeon who operates at the rate of 2,000 cataracts a year, the cases being taken just as they come, without waiting for the cataracts to ripen so long as they materially interfere with good vision, and that his operations are successful with practical uniformity, in spite of the absence of skilled nursing, and when this surgeon claims that his results are due to the method which he has adopted, we naturally want to know more about it. Extraction in the capsule, as practised by Smith, of Jullundur, has already been referred to in previous volumes of the *Annual* (1907, 1908). The great advantage of the method is that no soft lens matter can be left behind. The drawback is the increased risk of losing vitreous.[1] The incision is a sclero-corneal one, and includes slightly less than half the circumference of the cornea, being finished somewhat within its margin without any conjunctival flap. An iridectomy is usually performed, and so far the operation is done with the aid of a speculum. Now, however, the speculum is removed, and during the actual extraction, which is performed by the pressure of a large strabismus hook, a great deal depends on the assistant, who has to manipulate both eyelids so as to prevent any pressure being exerted by them on the globe. To the spectator, apparently, the procedure appears simplicity itself, and the result a perfect black pupil without the possibility of either lens matter or capsule being left behind to necessitate further complications. When he tries to do the operation himself, however,[2] he finds it not so simple, and is very likely to lose vitreous. Even the part of assistant is not so easy as it looks. Only those who have become familiar with the operation by prolonged apprenticeship seem, so far, to have been able to attain anything like the success of Smith himself, who in 19 cases out of 20, loses no vitreous at all. The success of the operation apparently depends almost entirely on the judgment of the operator in the amount and direction of the pressure employed in the actual extraction, and on the competence of his assistant in manipulating the lids. Hitherto the risk of excessive vitreous loss has deterred many from adopting the method.

Another device is frequently employed, both in India and elsewhere, for getting rid of soft lens matter in cases of unripe cataract, namely, intra-ocular irrigation with normal saline or boracic solution before or after the removal of the nucleus. The idea is not new, having been more or less practised since 1884, when it was recommended by McKeown, of Belfast. He introduced his irrigator nozzle inside the capsule before the removal of the nucleus. Herbert recommends a siphon douche to be employed only for the removal of refractory cortex. It consists of a flask, indiarubber tube, and glass nozzle. The following is a condensed account of his method of using it, taken from his book.[3] The flask being held at an elevation of rather less than a foot above the eye, the tip of the nozzle is brought quite close to the wound, a little above it; if the stream be directed into the anterior chamber, this may suffice to float up through the incision some or all of the cortex remaining in the eye. But usually

the extreme end of the nozzle has to be inserted at one angle of the wound. In perfectly steady eyes it may be passed far into the globe. It is rarely necessary to point the nozzle directly downwards within the chamber, and when this is done it is advisable to use fixation forceps to the globe. It is on the whole preferable to leave a little lens matter in the eye rather than to introduce the nozzle repeatedly far within the chamber, and rather than irrigate very freely. The chief disadvantage of the procedure is the risk of introducing infective organisms from the conjunctival sac into the globe. Both Herbert and Elliott,[4] however, claim to have practically eliminated the danger of suppuration after extraction by previous thorough irrigation of the conjunctival sac with perchloride of mercury lotion 1–3000, followed by wiping out the cul-de-sac with cotton-wool swabs under a stream of boiled water. The first-named had only one case of suppuration in 1000 cataracts treated in this way, and that was traced to an inefficiently treated lacrymal mucocele. Herbert had not a single suppurating case in 1655 extractions. For opaque capsules after extraction Herbert advocates early discission with a Graefe knife ground down to below a millimetre in width and inserted subconjunctivally.

Extraction in the capsule is being practised in America by certain operators.[5] Greene, out of 75 cases, had loss of vitreous in 13, but in spite of this, the usual results compared favourably with those of 75 operated on by the usual method. Würdemann, after doing 40 cases by Smith's method, regards it as far more dangerous than the usual one in the hands of any but the most highly skilled operators. Arnold Knapp agrees that the danger of vitreous loss is much greater than with the ordinary operation, though when the dislocation of the lens takes place readily, extraction in the capsule is an ideal and beautiful operation. Other speakers at this symposium referred to the formation of a partially opaque membrane in the anterior part of the vitreous as a sequel to vitreous loss at the operation, or even without this. Wiener had seen this happen in 3 cases out of 40 on whom he had operated by Smith's method. Excessive pain during the extraction, iritis from bruises during the extraction, and striped keratitis were also mentioned as complications more likely to occur than with the ordinary operation. It was generally agreed, on the other hand, that the average results were better.

Congenital Cataract.—Treacher Collins[6] has paid much attention to developmental deformities of the lens, especially in relation to different forms of congenital cataract. To understand the subject, we must bear in mind the stages in the development of the normal lens. They are thus summarized by Treacher Collins: (1) The down-growth of a fold of cuticular epiblast, which is separated in the form of a hollow vesicle from the rest of the surface epiblast by intruding mesoblast, and becomes surrounded by a hyaline capsule. (2) The lengthening out of the cells composing the posterior layer of the vesicle until they fill its entire cavity. These are the first-formed lens fibres and exist

as the most central part of the fully developed lens. (3) The proliferation of the cells lining the anterior capsule and their transformation at the sides of the lens into lens fibres: a transformation which is effected by their lengthening out anteriorly and posteriorly, so as to encircle the fibres developed from the posterior layer, lines of sutures resulting where their ends come in contact. This laying on of fresh fibres laterally goes on throughout life, but its rapidity is lessened as life advances by the increasing intracapsular tension tending to check the proliferative activity of the cells.

Corresponding to each of these three stages, there are certain typical forms of congenital cataract due to failure of the normal processes during that stage. Thus, during the first stage, the separation of the first rudiment of the lens from the cuticular epiblast may be incomplete until a comparatively late stage of growth. This causes defective nutrition at the anterior pole of the lens, and results in the congenital form of anterior polar cataract. [Most anterior polar cataracts are not congenital, but due to corneal ulceration in infancy]. Another defect which may occur in the first stage is the incomplete formation of a posterior capsule. This is normally formed from the cells which constitute the posterior layer of the lens vesicle, but these cells have other work to do at an early period, namely to lengthen out into fibres which form the nucleus of the lens. Hence the time for the formation of the posterior capsule is very short. Consequently, gaps in it sometimes occur, and these gaps are filled up by opaque fibrous tissue formed in the vitreous, and sometimes associated with a persistent hyaloid artery. Clinically, these cases may present the appearance of a grey reflex from the back of the lens, the lens itself remaining clear, or the whole lens may become opaque secondarily.

The important point in the treatment of these cases is to know that if, after absorption of the lens matter, after needling in the ordinary way, an opaque white mass remains, it is no good to try to needle this; but, by depressing it downwards out of the line of the visual axis, a good result may still be obtained.

Defective development during the second stage, i.e., failure of the cells of the posterior layer to develop into fibres, results in the failure to form a lens nucleus at all, and its replacement by a thin layer of opaque tissue derived from the proliferation of the anterior lens capsule as in anterior polar cataract. Lateral accumulations at the side of this mass may result from the activity of the cells lining the sides of the capsule. The result is a disc, or dumb-bell-shaped dense white opacity, occupying the centre of the pupil. When a discission operation is performed on these cataracts, with a little manœuvring the white central opaque part can be separated from the rest of the lens, and will then probably drop down into the lower part of the anterior chamber, where it may remain for an indefinite time, showing no tendency to become absorbed or give rise to any irritation. When the dense white patch has been picked off in this way, a central black opening is left, as can be easily understood from a study of the anatomy

of these cataracts. After discission a small amount of lens matter usually becomes liberated and absorbed, but only a very small amount compared with what is so affected in other cataracts.

Defects in the third stage of development—a failure in the lateral fibres to develop properly—may result in a small nucleus surrounded by an opaque milky fluid, a form of congenital Morgagnian cataract, or in cases where the defect of development has only been partial, it may merely appear as opaque lines where the lateral fibres normally meet each other, or intermediate degrees of defect may result in an adhesion of the nucleus to the capsule in front and behind, or behind only, resulting in different degrees of axial cataract.

Treacher Collins makes the following suggestions as to the treatment of congenital cataract:—

1. To wait until a child is 10 months old before operating. At an earlier age the cornea is so small and the anterior chamber so shallow that the necessary instrumentation cannot be so satisfactorily carried out as in the more fully developed eye. Moreover, the amount of aqueous humor is so small that it does not suffice for the solution of the liberated lens substance.

2. In some cases, in which the pupil is small and does not dilate well with atropine, it is best to commence with an iridectomy.

3. In nearly all cases it is well to begin with a needling; for valuable information can be obtained by its means as to the thickness of the capsule and consistency of the lens, should it fail to liberate much lens matter to the action of the aqueous.

4. If the cataract is a dense, white, anterior polar one, set in a ring of clear, or partially clear, lens substance, and apparently flattened from before backward (the so-called disc-shaped cataract), then an attempt should be made to separate the central white opacity with a needle and let it fall into the anterior chamber. Two needles are sometimes required to effect this.

5. If, on pricking the capsule, milky-white fluid escapes into the anterior chamber (congenital Morgagnian cataract), it is well at once to evacuate this fluid, for fear of increased tension ensuing.

6. In some cases of congenital cataract the whole lens and capsule can be removed in a most satisfactory way by grasping it with forceps. Very often, however, such a procedure is followed by escape of vitreous. It is difficult to differentiate which cataracts can be safely dealt with in this manner. They generally seem to be complete cataracts with a tough capsule, and lens matter of a gelatinous consistency.

7. If, after a needling and some absorption of liberated lens matter, a dense, tough, white, fibrous-looking membrane remains, there is probably some atypical development of the anterior part of the vitreous. An attempt had then best be made to forcibly displace the membrane downward and backward out of the axis of vision.

REFERENCES.—[1]*Ind. Med. Gaz.* Oct. 1908; [2]*Ind. Med. Rec.* June, 1909; [3]*Cataract Extraction* (1908), p. 137; [4]*Trans. Ophth. Soc.*, paper read Dec. 10, 1908; [5]*Jour. Amer. Med. Assoc.* Sept. 4, 1909; [6]*Ibid.* Sept. 26, 1908.

CEREBROSPINAL FEVER. *E. W. Goodall, M.D.*

Diagnosis.—F. E. Larkins[1] gives the results of a careful study of 40 cases of this disease which were under his care in the Leith Public Health Hospital. He says: "The onset may simulate almost any of the infectious diseases, but of these typhus bears the greatest resemblance. I had three cases sent in as typhus that were cerebrospinal fever, and two sent in as the latter which turned out to be typhus. . . . . Though there are many points of resemblance, the onset in typhus is not so severely abrupt, the temperature is very characteristic, with its rapid rise, maintenance, and subsidence by crisis, the face is also much congested and suffused, leucocytosis is slight or absent, and the urine gives a beautiful positive diazo reaction."

W. Dow,[2] after a thorough investigation of the condition as to leucocytosis of thirty-six cases of cerebrospinal fever, concludes that the disease is always accompanied by leucocytosis, whether the attack is acute, abortive, mild, or chronic; and that the leucocytosis consists in all instances in an increase in the number of polymorphonuclear cells. In the Glasgow epidemic it was found that cerebrospinal fever quite frequently resembled tuberculous meningitis, other forms of non-tuberculous meningitis, and pneumonia, and occasionally the clinical features were not unlike those of enteric fever, typhus fever, and bubonic plague. The presence of leucocytosis is of value only in excluding enteric fever commencing with meningeal symptoms, as in that disease leucopenia is the rule.

Treatment.—The opinion of most physicians is still in favour of the injection into the spinal canal of a specific **Serum** such as that of Flexner and Jobling, as being the treatment most likely to result in a favourable termination. The details of this method have been fully described in the last two volumes of the *Medical Annual*. Favourable opinions, based on personal experience, have been expressed by Churchill,[3] (Chicago), Dunn[4] (Boston), Welch[5] (Philadelphia), Koplik[6] (New York), Vaillard[7] (Paris), Netter[8] (Paris), and Jehle.[9] On the other hand, Schlesinger[10] (Vienna) and Knöpfelmacher[11] are not inclined to attribute favourable results to the serum. Flexner[12] is reported to have said that it was too early to state the true value of the serum, as the number of cases had been insufficient; the final test must come in the future at a time when an epidemic exists and when the serum can be administered early. Besides the specific treatment, the following measures will be found useful:[13] The room in which the patient is isolated should be well ventilated, warm, and quiet. In the acute stage fluid nourishment should be given in small quantities at a time; if food is refused or there is inability to swallow, nasal feeding must be resorted to. **Alcohol** in small quantities is in some cases beneficial. Hot applications to the nape of the neck are efficacious to relieve pain. **Hot Baths** are very beneficial; the patient should be placed for ten to fifteen minutes in a bath of 107° to 110° F. three times a day. Larkins proved that chronic cases especially improved under the baths. Failing baths, the patient should be

sponged twice daily with hot water. Of drugs, **Morphia** in liberal doses is of the utmost value, and during convalescence **Potassium Iodide.**

In the discussion on the treatment of cerebrospinal fever that took place at the Sheffield meeting of the British Medical Association, Emmett Holt[14] stated that serum might be injected into the spinal canal even after a " dry " puncture, i.e., one in which no cerebrospinal fluid has been withdrawn—if it was done with caution. Welch,[15] however, reports a case in which a rapidly fatal result followed the injection of serum after a " dry " puncture ; and Hand[16] reports another in which serious, but not fatal, symptoms ensued ; so that it would seem to be inadvisable to inject under such circumstances. Larkins[13] recommends using a stilette with the injection needle, to clear out any pus or thick lymph that may block the needle. He believes that this measure will diminish the number of " dry " taps. The same observer also recommends the use of a local anæsthetic ; 0·5 cc. of **Eudrenine** should be injected at the point where the lumbar puncture is to be performed.

REFERENCES.—[1]*Pract.* June, 1909 ; [2]*Lancet*, Mar. 20 1909 ; [3–5]*Jour. Amer. Med. Assoc.* Sept. 11, 1909 ; [6]Quoted in *Med. Rec.* June 5, 1909 ; [7–11]*Sem. Méd.* May 5, 1909 ; [12]Quoted in *Med. Rec.* June 5, 1909 ; [13]Larkins, *Pract.* June, 1909 ; [14]*Brit. Med. Jour.* Oct. 31, 1908 ; [15, 16]*Jour. Amer. Med. Assoc.* Sept. 11, 1909.

CEREBROSPINAL MENINGITIS, EPIDEMIC.

Purves Stewart, M.D., F.R.C.P.

In view of the infective nature of cerebrospinal meningitis, the question of prophylaxis of the disease is of the utmost importance. It has been well established that the meningococcus is often present in the nasopharynx, not only of patients suffering from symptoms of the actual disease, but also in healthy subjects who have been in contact with these patients. Such persons, although they not infrequently escape actual meningitis, act as carriers of infection, inasmuch as they mingle with other healthy persons, and may infect them by means of nasal and buccal secretions. A fact of great significance is that the meningococcus can live for long periods in the nasal mucus. Castaigne,[1] in an interesting review of this subject, quotes certain observations on this particular point. Thus Netter examined the nasopharynx of 231 school children at St. Denis, near Paris, and found the meningococcus present, in 49 subjects, who were, therefore, " latent " sources of infection. Still more striking were Jacobitz's observations on individuals who had been in contact with meningitic patients, but who themselves were apparently healthy. Out of 190 such persons, 62 were found to have meningococci in the nasopharynx. In 24 apparently healthy persons belonging to four families, each of which had some member who had suffered from cerebrospinal meningitis, Ostermann found the meningococci present in no fewer than 17.

The length of time that the meningococcus persists in the nasal fossæ is very variable, but it seems established that the organism can survive for long periods. In a patient who had suffered from the disease,

Netter found the meningococcus fifty days later, but as a rule the organism tends to disappear earlier than this. Nevertheless, it is well established that in certain cases healthy individuals may be carriers of virulent infection for a long time after having been merely in contact with a meningitic patient. The meningococcus has been found present for various periods up to two months or even longer. Setler reports a striking case, where a man, who had been infected three months before, returned convalescent to his regiment, although meningococci were still present in the nasopharynx. Seven days after his arrival, ten men out of thirty in his part of the barracks were found to have become carriers of the organism.

What is the practical lesson to be drawn from such facts? It is, that it is not sufficient to segregate the actual patient, but that careful attention must also be paid to every person who has been brought in contact with him, including, and specially including, the doctor himself. Strict quarantine is obviously impracticable. We must rather devote our attention to measures which will disinfect the nasopharynx, so as to kill the meningococcus *in situ*, e.g., by suitable insufflations. Wasserman has proposed nasal insufflations of dried antimeningococcus serum. Unfortunately, the bactericidal power of such dried serum is insufficient, probably because the powder does not sufficiently diffuse itself over the mucous surfaces. Amongst other substances which have been used for the same purpose are **Corrosive Sublimate, Protargol,** and **Pyocyanase,** of which the last-mentioned seems to have given satisfactory results in a certain number of cases. Vincent and Bellot recommend the following as still more efficacious: 60 per cent alcohol 100 parts, containing **Iodine** 10 parts, **Guaiacol** 1 part, and **Thymol** $\frac{1}{8}$ part. This solution should be evaporated and the vapour slowly sniffed into the nose for three minutes at a time four or five times daily. The fluid is evaporated by placing it in a small porcelain dish within another vessel filled with hot water. In addition to this, they recommend swabbing the tonsils and pharynx with **Iodized Glycerin** 3 per cent, and also frequent gargling with **Oxygenated Water** 10 per cent. If these measures be systematically carried out, the meningococci generally disappear from the nasopharynx within four days, even in cases in which the patient was already the subject of chronic pharyngitis. Some such régime should be insisted on, not only in patients suffering from cerebrospinal meningitis, but in all persons who have been brought into contact with the patient. The doctor himself should set the example in this matter.

Once the malady actually attacks a patient our best means of treatment lies in repeated withdrawals of cerebrospinal fluid by means of **Lumbar Puncture,** together with the introduction into the cerebrospinal canal of **Antimeningococcus Serum.** Of the sera in the market, the two which have yielded best results in this country appear to be that of Flexner, of New York, and that made by the Lister Institute of London. I myself have had several cases of recovery in patients apparently moribund, who were treated by repeated injections of the

Lister serum. One of these was in a young man of thirty-five, who was mentally dull and delirious, with head-retraction and well-marked Kernig's sign, and in whom the cerebrospinal fluid was turbid and contained over 2600 polynuclear leucocytes per mm., forming a well-marked deposit at the bottom of a test tube. Three injections, each of 30 cc., of antimeningococcus serum produced a marked improvement, and after a sharp attack of joint-pains, the temperature gradually subsided, and the patient made a complete recovery.

REFERENCE.—[1] *Jour. Méd. Franç.* Aug. 15, 1909.

CHEEK AND JAW, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

Lucius Hotchkiss,[1] of New York, describes a very useful and ingenious operation for extensive cancer of the cheek involving the jaw. In cases of cancer of the cheek, glandular involvement of the

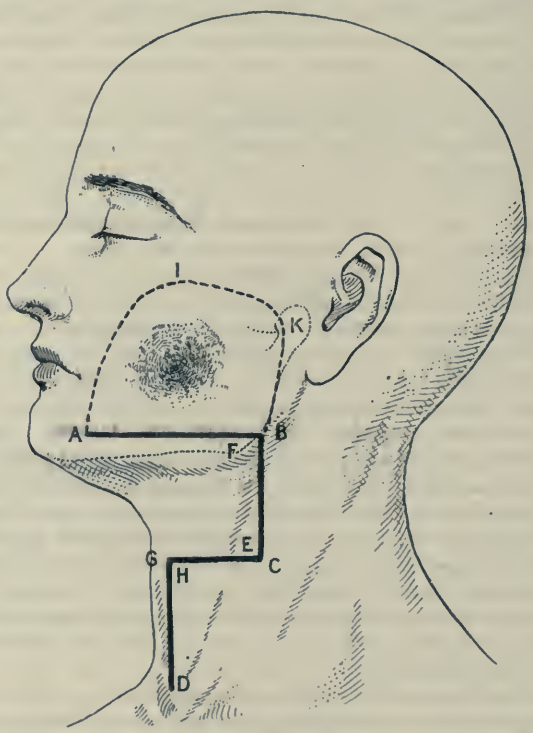

Fig. 13.—Hotchkiss's Operation for Cancer of the Face. The heavy lines mark the outline of the flap from neck to cover defect in cheek, the dotted line the portion circumscribed.

tributary lymphatics is not necessarily deep or extensive, even in advanced cases, and internal metastases may not be present at any time. He quotes a statistical paper by Anton Meller,[2] which gives the results of a careful study of epithelial carcinoma of the head and

neck, based upon the review of 327 cases of epithelioma observed in Hochenegg's clinic in Vienna between the years 1894 and 1904. It was found that in 50 per cent of the cases there was no recurrence after operation within the three-year period, and of those which were operated on for recurrence 21 per cent remained free. Meller found, moreover, that when recurrence did occur it was more often local than in the glands, and that internal metastases had rarely occurred before the patients came to operation. Cancers in certain regions were more

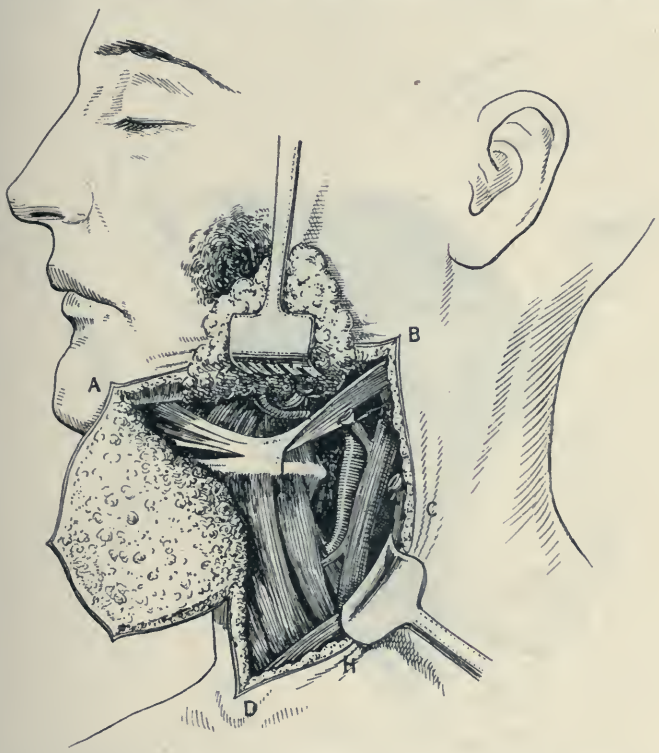

Fig. 14.—Hotchkiss's Operation. Skin flaps retracted, showing exposure obtained. Deep glands dissected up and extracted. External carotid ligated.

dangerous as regards glandular metastasis than in others; e.g., in the lower lip this was found in 90 per cent of all of them, while in cancer of other parts of the head and face, gland involvement was observed in but 18 to 43 per cent. Removal of infected glands up to the size of a pea or walnut always gave good results when they only occurred in small groups or singly, but in those cases where the glands could be followed down to the clavicle others would usually be found in the mediastinum. Finally, it was found that in really "inoperable" cases an operation materially hastened the end by hastening extension

along the opened-up channels and mutilated tissues; and Meller declares boldly that similar bad results often follow rough attempts at removal of perfectly operable growths by inexpert operators.

The operation which Hotchkiss devised and successfully practised in two cases is as follows: An incision (*Fig.* 13, *A*, *B*, *C*, *H*, *D*) is made through the skin, and the flap *A*, *B*, *C*, *H* is turned forwards towards the middle line, exposing the lower border of the inferior maxilla, the platysma overlying the submaxillary gland, and the deep structures

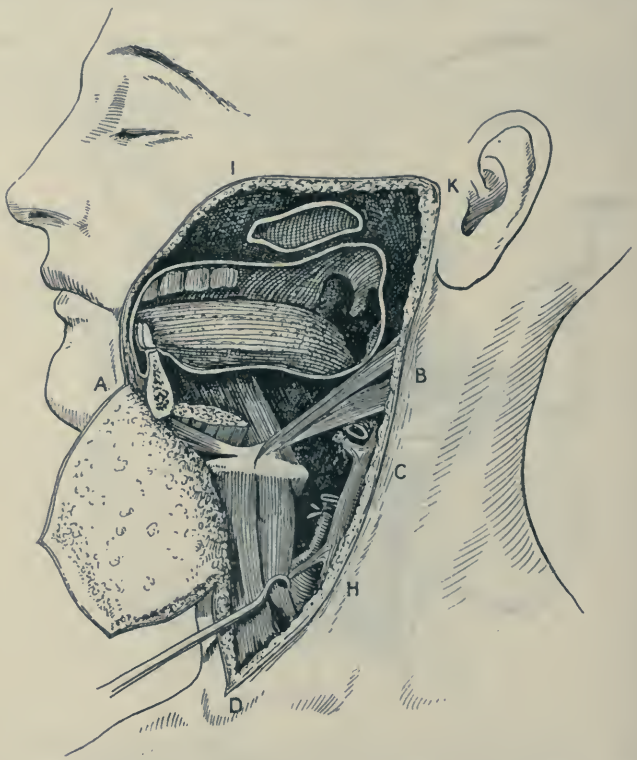

Fig. 15.—Hotchkiss's Operation. Tumour removed, with large portion of cheek and half the lower jaw and portion of upper jaw. Cavity of mouth opened.

of the neck. The sternomastoid is freed along its anterior border, thus exposing the chain of enlarged glands extending from the submaxillary space to below the level of the cricoid cartilage. Beginning below, the entire chain of lymphatic glands along the internal jugular vein and beneath the sternomastoid muscle is removed, together with any periglandular fat, in one piece from below upwards, until the bellies of the digastric come into view, and then the contents of the submaxillary space (both the salivary and lymphatic glands) are shelled

out cleanly and retracted upwards in one piece. The external jugular and facial veins are ligated and divided, and the external carotid artery is isolated and divided between ligatures of chromic gut just above the origin of the superior thyroid branch. The outer surface of the lower jaw having been exposed and cleaned ready for section, and the neck wound protected by gauze packing, the skin of the face is divided in such a manner as to widely circumscribe the growth along line (*Fig.* 13 and 15) *A*, *I*, *K*, *B*, and the mouth rapidly entered. The jaw

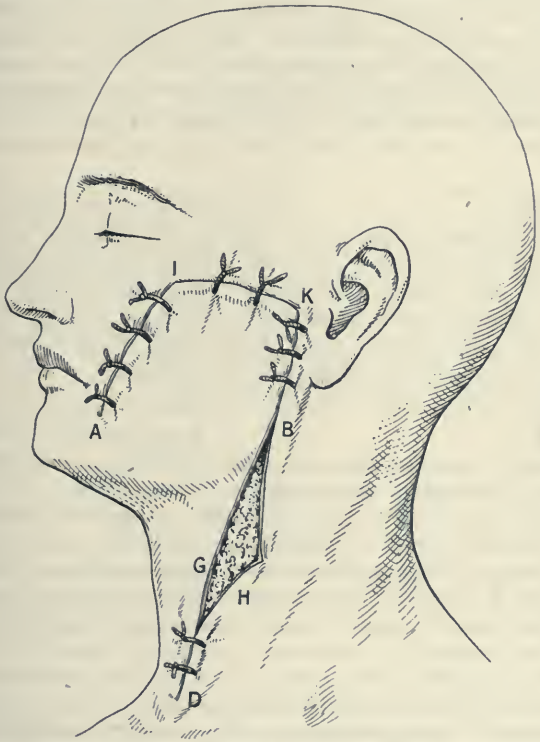

Fig. 16.—Hotchkiss's Operation. Plastic flap from neck sketched in place covering defect in cheek.

is then divided with a Gigli saw through the socket of the canine tooth, the extent of the growth within the mouth being plainly visible. When the cut end of the jaw is retracted, incisions through the mucous membrane well clear of the growth are made. The mucous membrane and structures of the cheek are divided along the alveolar margin of the upper jaw back to the molars, and the floor of the mouth is divided along the groove of the tongue, severing the mylohyoid and hyoglossus muscles. The inferior maxilla and attached structures are then retracted outward, and the growth is removed. In one case

the alveolar process of the upper jaw as far forward as the canine tooth, the floor of the antrum, the pyramidal process of the palate bone, the lower end of the internal pterygoid plate, with the hamular process, the lower end of the external pterygoid plate, and a portion of the malar bone were removed. The mucous membrane at the side of the tongue is united to the cut edge of the hard palate, the tongue being elevated as a sort of wedge against leakage from the mouth. The skin margins are united as in *Fig.* 16, and a portion of the incision is left unsutured and filled with loose gauze packing extending up to the glenoid and temporal fossa. The packing is left in several days until granulation is established. The external carotid may be ligatured, or temporary compression of the common carotid artery after the method of Crile may be employed. The patient sits up as soon as possible, and is fed through the nose for some days.

REFERENCES.—[1]*Ann. Surg.* Oct. 1908; [2]*Zeits. f. Krebsforschung*, 1907, xvi. 64.

CHILBLAINS. *E. Graham Little, M.D., F.R.C.P.*

Mansel Sympson[1] confirms the efficacy of **Peroxide of Hydrogen,** in chilblains. The affected parts are bathed in the 10 vol. solution diluted with equal parts of previously boiled and still hot water, for fifteen to twenty minutes twice daily. If much pain or irritation is complained of, the dilution should be greater. He has usually found this treatment efficacious within two or three days.

REFERENCE.—[1]*Brit. Med. Jour.* Jan. 30, 1909.

CHLOROSIS. *George Lovell Gulland, M.D.*

Hawthorne[1] discusses the optic neuritis which occasionally occurs in chlorosis, and endeavours to explain its causation. He believes it to be due to thrombosis of veins or sinuses within the cranium, occurring in a "quiet" way, as thrombosis often does in those cases, in systemic veins, and giving rise to no other symptoms. His results are based to a certain extent on post-mortem findings, and his discussion of the general effects of thrombosis is very suggestive.

Barié[2] has studied the volume of the heart in chlorotics in eighteen cases. He bases his work on the size of the deep dullness in square centimetres (a method which allows considerable error), and concludes that there is often an appreciable reduction in the volume of the heart; but that, on the other hand, dilatation is not infrequent. It occurs principally as a result of atony of the myocardium; and also in dyspeptic cases, especially when combined with neurasthenia. Whatever their cause, these dilatations are generally temporary, and do not attain the size of those due to valvular disease or other organic changes.

REFERENCES.—[1]*Lancet*, Sept. 1908, *Med. Rev.* Nov. 1908; [2]*Rev. de Méd.* Aug. 1908.

CHOLERA. *J. W. W. Stephens, M.D.*

R. P. Strong,[1] in a general article on the methods of combating cholera in the tropics, gives those adopted in the Philippines. (1) All cases were isolated. (2) The city of Manila was divided into districts,

and each district inspected day and night for cases. (3) All wells were closed, and distilled water was distributed. (4) The river from which the drinking water was procured was guarded by troops to prevent it becoming infected. (5) Certain districts thoroughly infected with cholera and impossible of disinfection were destroyed by fire, and compensation given. (6) Bacteriological investigations of the city water proved it to be free from cholera vibrios, but it was found that uncooked foodstuffs were one of the chief means of spreading the disease, and consequently a number of foods and fruits were forbidden for sale in the markets. (7) Flies were also shown to play a part in the infection of food from unsterilized excreta. (8) **Protective Inoculation** was given an extensive trial, and certain statistics show that the number of cases among the inoculated is only one-sixth of that which has occurred among the uninoculated. It is thought that this may eventually be the most effective way of exterminating the disease.

R. W. Burkitt[2] strongly advocates the use of **Morphine** in cholera. The hypodermic injection of $\frac{1}{4}$ to $\frac{1}{3}$ gr. is the first of two essentials. It stops vomiting, diarrhœa, colic and cramps, and gives perfect rest, and in the majority of cases sleep from five to eight hours. In cases of extreme collapse after the morphine, saline solution is given intravenously. The next essential is to give the patient as much **Water** as possible—every few minutes while awake. Provided that morphia has first been given, the water does not now produce vomiting. Water and hot tea eventually produce a flow of urine where this may have ceased for two or three days.

L. Rogers[3] has followed the treatment described by the previous author of giving morphia hypodermically, but has not had any approach to the same good results. Calomel should be given, if at all, in $\frac{1}{4}$-gr. doses repeated several times. The author advocates the intravenous injection of **Hypertonic Salt Solutions** (1·25 per cent). By this method he claims to have reduced the mortality to 33 per cent—including all late and moribund cases—or half what it had previously been.

Gupta[4] also speaks very favourably of this treatment, and says that the effect of the injection is to cause the pulse to return to the wrist; the patient becomes quiet; the cramps disappear; the body becomes warm; pain if present disappears, cyanosis decreases, and the voice becomes normal. About 63 per cent of cases recover.

E. J. O'Meara[5] uses for transfusion a 0·625 per cent saline solution. In the case of natives he does not transfuse until the pulse has disappeared from the wrist, but considers this not a safe rule to follow in the case of Europeans and children. Injection into the cellular tissues is worse than useless, and fluid by the mouth must be given with great caution, as the stomach may become over distended; vomiting, sudden collapse, and death following. The author advocates controlling the transfusion by taking the specific gravity of the blood at the bedside. This is done by Hammerschlag's benzene-chloroform

method. The object of this is to bring the specific gravity of the blood slowly to the normal instead of diluting rapidly as is usually done. When the dilution is made rapidly, water soon begins to flow out of the vessels again, and a recurrence of watery evacuations ensues; but when the dilution is made very gradually, and the specific gravity slowly brought to normal, the endothelium of the vessels has time to take up fluid and regain its normal function; and eventually the normal flow from vessels to tissues is established.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* Feb. 13, 1909; [2]*Brit. Med. Jour.* Sept. 9, 1908; [3]*Ind. Pub. Health*, May, 1909; [4]*Calcutta Med. Jour.* in *Ther. Gaz.* Nov. 15, 1908; [5]*Ind. Med. Gaz.* Oct. 1908.

CHOREA. (*See also* BLOOD, THE, IN DISEASE.)

(*Vol.* 1909, *p.* 205)—**Camphor Monobromate** is recommended by Baccelli and other Italian physicians, in doses of 15 gr. per diem, raised rapidly to 30 gr.

CIRRHOSIS, TROPICAL BILIARY, OF CHILDREN.

J. W. W. Stephens, M.D.

F. Pearse[1] gives a short description of this peculiar disease of the liver in children. It occurs almost exclusively in children from six months to two years of age. The disease lasts for a month to two years. Symptoms: The first symptom is enlargement of the liver, but early ones are nausea, vomiting, sallow complexion, and slight fever. The liver enlargement is progressive, there is some tenderness, and jaundice and œdema supervene. The stools are clayey, but the urine is high-coloured. The prognosis is extremely unfavourable. There were 636 deaths from this disease among children in Calcutta in 1907. Post mortem there is an intercellular cirrhosis. At first the liver is enlarged, but later it becomes small. The kidney shows marked degeneration and desquamation of the tubular epithelium.

REFERENCE.—[1]*Ind. Med. Gaz.* Feb. 1909.

COCCYGODYNIA. *Purves Stewart, M.D., F.R.C.P.*

Coccygodynia, or painful coccyx, is an affection which is more frequently met with in women than in men. Before diagnosing any case as neuralgic in nature, we must first satisfy ourselves by a careful local examination, in conjunction with the history of the case, that there has been no fracture or other injury of the coccyx. The pain in coccygodynia is produced by anything which puts the coccyx on the strain, especially by defæcation (both the sphincter and the levator ani being attached to the coccyx), or by sitting down. The pain in sitting may be due to displacement of the coccyx from fracture, or it may be the result of muscular contraction of the gluteus maximus, which arises partly from the coccyx.

Fracture of the coccyx is most commonly produced during parturition in elderly primiparæ in whom the sacrococcygeal joint is often ankylosed; but it may also result from external injuries, as from a kick, blow, or fall on the coccyx, or by sitting down suddenly on a narrow object, such as a brick, rail, or the back of a chair. Such fractures can be recognized by examination per rectum, which reveals

a displaced coccyx, tender on movement, and in these cases excision of the coccyx is the only efficient treatment.

In other instances, coccygodynia is the result of a painful pile, or an anal ulcer; both of which conditions can only be recognized by local examination per rectum. Rheumatic and gouty affections of the sacro-coccygeal joint, or of the coccygeal ligaments, are recognized by the presence of the corresponding diathesis with similar affections of joints and fibrous tissues elsewhere. Such cases are treated on the usual principles for rheumatism or gout.

Lastly, coccygodynia may be a pure neurosis, where none of the above-mentioned causes are present. In such cases a suppository of **Morphia** 1 gr., of **Belladonna** ½ gr., with **Morphia** ¼ gr., will often relieve the pain, or in more severe cases the application of a **Paquelin Cautery** may be required, in addition to the ordinary measures for the treatment of the neurasthenia or hysteria, as the case may be.

COLITIS, MUCOUS. *Robt. Hutchison, M.D.*

Ransome[1] states that there are only two really distinct forms of treatment for this complaint which are worthy of consideration. These are Von Noorden's and the so-called Plombières or intestinal lavage system. **Von Noorden's Treatment** is essentially one of diet, but in place of the usual bland, unirritating diet with little residue, even now recommended by high authorities in the treatment of mucous colic, he advocates a coarse laxative diet, leaving as large a residue as possible. He prevents the usual irritating effect of such a diet by adding to it large quantities of fat in various forms. The most important element in his diet is cellulose, obtained from vegetables and the husks of various leguminous plants. As Von Noorden says, the cellulose undergoes bacterial decomposition in the intestine, but so gradually does this take place that the binding of the fæces into solid hard lumps is prevented.

The author then gives the details of Von Noorden's treatment as he has carried it out in practice. To begin with, it must be borne in mind, first, that the subjects of mucous colitis are usually neurotic, and secondly, that the treatment is a "trying" one, especially at its commencement. For these reasons it is better that the patient should be isolated in a nursing home with a firm but sympathetic nurse, and that the physician in charge should encourage perseverance and instil the patient's mind with confidence in the result of the treatment.

The treatment should be carried out in the same way, whether it be commenced during an acute paroxysmal attack or during an interval. The patient should go to bed and stay there. A rubber hot-water bottle is to be placed on the abdomen whenever there is distention or pain, and at night an enema of 6 to 10 oz. of olive oil at a temperature of 98° F. is given slowly from a douche-can with a long soft-rubber nozzle (8 ins.), preferably in the genupectoral position, or on the back with the hips raised. A suppository of belladonna extract (gr. ½) or of morphine if the pain is severe, should be inserted, and the patient

directed to retain the oil until morning. It will probably be necessary to continue the oil and suppository for several days, but as soon as the bowels act naturally they are given up.

The author gives a typical dietary which contains the essentials of the treatment, but in which modifications, especially in quantities, must, of course, be made to suit individual patients.

7 *a.m.*—½ pint milk-cream mixture.

8 *a.m.*—½ pint Kissingen water.

9 *a.m.*—½ pint cocoa with cream, 2 oz.; bread, 2 oz.; butter, marmalade.

10.30 *a.m.*—Massage.

11.30 *a.m.*—12 oz. special soup; 3 oz. bread, 1 oz. butter; potatoes, green vegetables, baked apple, stewed pears, or boiled gooseberries; cream. Rest for two hours with hot bottle on abdomen.

4 *p.m.*—½ pint milk-cream mixture.

7 *p.m.*—Dinner, like lunch, but with 3 oz. bread and 2 oz. butter.

9.30 *p.m.*—½ pint milk-cream mixture.

A description of certain items in this dietary may be found useful.

Milk-cream mixture.—This consists of equal parts of milk and cream, and one teaspoonful of sugar of milk. The cream should contain 30 per cent of butter-fat, and nearly a pint should be taken in the twenty-four hours.

Kissingen water.—This is used as a stomachic, not as an aperient.

Bread.—This must be of the coarsest flour obtainable. The larger proportion of husk it contains the better. The usual brown bread sold as whole-meal bread is not sufficiently coarse.

Butter.—The average total quantity should be ½ lb. a day; 5 or 6 oz. of this is taken with bread, the remainder being used with the vegetables.

Special vegetable soup.—This the writer considers to be the most important item of the diet, and should be prepared carefully according to the following directions. Preparation of vegetable pulp: Place a breakfast-cupful of lentils or dry peas in a pan in sufficient cold water to cover them, and allow them to soak all night. In the morning add a slice of fat bacon about 6 ins. by 2 ins. and ¼ in. thick, and boil for one hour. Put one teaspoonful of butter and one of flour into a small pan on the fire, add a teacupful of milk gradually, stirring all the time until well mixed. Then add a teaspoonful of cream and mix with the pulp. To vary the flavour, a sufficient quantity of green peas, spinach, asparagus, or other green vegetable should be placed in cold water and boiled for half an hour, rubbed through a sieve, and added to the soup. The soup should contain all the husks of the peas or lentils, and should be more of the consistency of porridge than of soup.

Meat.—This may be of any kind, but is more easily digested if prepared as follows: It is cut up finely with a sharp knife, and thoroughly pounded in a mortar while raw. It is then mixed with sufficient beaten-up white of egg and milk to make a thick cream, placed in a china cup, and boiled in a pan of water for three to five minutes, being well stirred during the process.

Vegetables.—These should be of the coarse green varieties—cabbage, spinach, Brussels sprouts—well boiled and mashed with butter.

Massage.—This is used mainly for two purposes: (1) During painful spasms of the colon, when very light massage of the abdomen—"effleurage"—has a soothing effect, diminishing the pain; (2) Regular daily massage of the abdomen to improve the muscular tone of the bowel. To this may be added electrical treatment. In addition, general massage is useful for promoting the general nutrition of the patient and for inducing sleep.

The result of this treatment is that after two or three days, during which there may be much painful flatulent distention of the bowels, a natural action occurs—the fæces being of a soft, buttery consistence, entirely different from the hard mass previously formed, and also different from the watery motions obtained by aperient medicines. When a daily evacuation has been really established, the patient may be allowed to get up for two hours daily and go for a walk or drive, but it is usually necessary to continue the treatment for at least six weeks. After this a gradual return may be made to more ordinary diet, but plenty of coarse bread, coarse vegetables, and fat should remain a permanent constituent of the diet.

The author considers Von Noorden's treatment by diet to be the best, but if for any reason it cannot be properly carried out, there is no doubt that the **Plombières System** of treatment is very useful. In cases in which the attacks of pain are very frequent and in which the patient would be unable to stand the first few days of the Von Noorden treatment, the Plombières "cure" may pave the way and enable the patient to undergo the more drastic treatment. It consists in the use of a particularly soft water for thorough lavage of the large bowel, for drinking purposes, and for external baths; the whole effect being soothing and palliative to the irritable, spasmodic bowel, as well as to the "nerves" of the patient.

REFERENCE.—[1]Abstr. in *Ther. Gaz.* Nov. 15, 1908.

COLITIS, ULCERATIVE. *Robt. Hutchison, M.D.*

In an address on "The Natural History of Ulcerative Colitis," Hawkins[1] reviews the relation of this disease to bacillary dysentery, and concludes that although there are strong clinical grounds for presuming an identity between the two, yet bacteriological proof of it is not yet obtainable. He thinks that this discrepancy may perhaps be explained by the assumption of a concurrent or consecutive action in the chronic sporadic disease, of organisms of the paratyphoid or coli variety, or of pyogenic cocci.

TREATMENT.—From his point of view two classes may be considered.

1. *Dysenteric Diarrhœa.*—A short, mild attack may yield to opium and bismuth, but in using these and such-like drugs we are only treating a symptom, and are relying on a natural resistance to the infection which may or may not be forthcoming. It is clear that ipecacuanha has no specific influence on the disease. As regards Japanese dysentery,

Shiga says of ipecacuanha that "it has a very poor place as a dysenteric remedy." In asylum dysentery, also, it appears to be useless. The general custom now is to use **Calomel,** and he believes this to be the best line of treatment. Shiga gives 8 to 12 gr. once or twice, or one dose of castor oil 3 to 5 dr., or one dose of calomel followed by castor oil. In asylum dysentery also Gemmell found calomel beneficial. Hawkins prefers to give it in frequent small doses rather than a few heroic doses, and to combine it with opium. Calomel, 1 or 2 gr. with opium, ¼ gr., can be given three or four times a day. With the calomel treatment Shiga recommends simple enemata of 1 per cent saline or soda solution for cleansing purposes (no astringent being permitted), with suppositories of opium, cocaine, or belladonna, and if there is much hæmorrhage he applies an ice-bag to the abdomen and gives opium by the mouth. Whatever temporary views we hold as to the nature of ulcerative colitis, it is wise to use the **Serum** of the Lister Institute in all acute cases. By its use Shiga states that "the course of the Japanese disease is shortened in those who recover, and lengthened in those who otherwise would die," and his figures show under its use a diminution of the mortality by about one-half (from 22 to 26 per cent, to 9 to 12 per cent). The serum is bactericidal and antitoxic.

2. *Acute and Chronic Necrotic Disease.*—In a case which is severe from the first, and in which fever and toxæmia are considerable, and widespread inflammation and necrosis of the mucosa are manifested by abundance of polymorphonuclear leucocytes and blood in the stools, the same line of treatment may be adopted. But if improvement is not quickly seen, we are face to face with a condition which may either prove fatal in the next few weeks or may tail off into the chronic and nearly incurable form. The question of local treatment, in addition to the use of serum, becomes imperative. It is easy to be too optimistic and to wait too long for cure. In genuine ulcerative colitis, as distinguished from the great functional and sub-inflammatory conditions of the colon with which it is often confounded, and in which cures under any treatment are common enough, a deceptive appearance of health may be preserved for a time, while the disease extends upwards. Even a pure lower segment infection may quickly get out of control. We have to decide between irrigation per rectum, appendicostomy and irrigation, and colostomy with irrigation and the establishment of a free artificial anus. The right plan can only be settled by the severity of the toxæmia and the probabilities as regards the extent of the disease in each individual case. Hawkins has no high opinion of irrigation per rectum. Irrigation by **Appendicostomy** has advantages over rectal irrigation, but in no other respect has appendicostomy anything to recommend it. But looking back on many of these cases and on the condition of the colon after death, he believes that **Colostomy** will prove to be the most life-saving proceeding in the long run. It affords complete rest to the colon as well as efficient irrigation.

The irrigating fluids that may be used are innumerable. Silver nitrate, creolin, boric acid, argyrol, and tannin are often used. Among

other things he has tried methylene blue (2 to 3 gr. in a pint). In one stationary case under his care, milk, in which lactic acid bacillus had been incubated for twelve hours, was injected daily through an appendicostomy for a long time without obvious result. He has given similar milk freely by the mouth, and in large quantities by rectal irrigation without any apparent benefit. In his most successful case he used an emulsion of **Sulphur,** 120 gr. in 4 oz. of oil. This was thrown into the colon through an artificial anus every other day, and on the alternate days thorough sluicing with boric-acid solution was carried out. This was employed for seven weeks. With the same idea of using something that will adhere to the mucosa, Shiga has used enemata of gum arabic mixed with bismuth, gallate of bismuth, or iodoform.

The unpleasantness of an artificial anus can be mastered, and the patient who must use it is by no means a social outcast. The disadvantage lies in the fact that when the colon is out of use it undergoes progressive contraction, and becomes surrounded by dense fibrous fat, so that after the lapse of a certain time (perhaps a year) both closure of an artificial anus and the performance of ileosigmoidostomy become difficult, dangerous, or impossible. It is clear, therefore, that it may be necessary to leave the artificial anus open for a long time, and perhaps permanently.

REFERENCE.—[1]*Brit. Med. Jour.* Mar. 27, 1909.

CONJUNCTIVA, DISEASES OF.

John H. Yearsley, M.A., M.R.C.P., F.R.C.S.

Ophthalmia Neonatorum.—The conclusions and recommendations contained in the Report of the Ophthalmia Neonatorum Committee[1] have been substantially approved by the Council of the British Medical Association,[2] and are the result of long and earnest discussion upon a matter of first importance. The Committee finds that ophthalmia neonatorum accounts for upwards of 10 per cent of all cases of blindness; that the disease shows a slight decrease, so far as can be judged by returns from British lying-in hospitals and departments, and eye hospitals; that it is still the cause of at least one-third of the blindness of British blind schools; and that cases of the disease are not confined to the practice of midwives. The administrative measures advised are: compulsory notification of ophthalmia, the form also bearing the name and address (1) of the midwife who attended, (2) of the registered medical practitioner; inspection by the local sanitary authority, upon receipt of notification, so as to provide for efficient treatment, the separation of mother and child to be avoided if possible, and a copy of the certificate to be sent by the medical officer of health to the local supervising authority if a midwife has been in attendance; bacteriological examination by the local sanitary authority, free of cost, of vaginal or conjunctival discharge, at the request of a qualified medical practitioner; the recognition by the Midwives Board of the presence of a purulent vaginal discharge as a signal for medical help; the

exhibition of public notices calling attention to the dangers of ophthalmia neonatorum, and the periodic distribution of such notices to midwives by the supervising authority ; lastly, the appointment of an ophthalmic surgeon to, and the maintenance of accurate records concerning ophthalmia in, every maternity hospital.

The Report contains the following explicit directions to midwives and nurses : In every case in which a medical practitioner is not in attendance, wipe the lids and the surrounding skin clean on each side with a separate piece of sterilized wool directly the head is born, and before the eyes are opened. Drop nothing into the baby's eyes. Do not wash the face and body in the same water. Take fresh water for each. If there is a purulent vaginal discharge, whether in pregnancy or labour, obtain medical help. If a doctor is not already present when the child is born, send for one immediately. If there is any inflammation of the baby's eyes, however slight, shown by redness, swelling, or discharge, explain that the case is one in which medical help should be obtained, in accordance with the Rules of the Central Midwives Board. Appended to the Report is a valuable memorandum by Sydney Stephenson.

The Committee on Ophthalmia Neonatorum of the American Public Health Association[3] finds that, though the incidence of the disease (and consequently of the blindness which may follow it) is diminishing, disastrous cases, not seen by any physician, are far too common. The Committee strongly insists on the wisdom of instructing the midwives and the public as to the dangers of ophthalmia, the need of careful prevention, and the necessity, should inflammation appear, of skilled and timely assistance. It is urged that immediate notification of the disease should be compulsory, and that the health board of each state should decide upon an efficient prophylactic, preferably one of the following : 1 per cent solution of silver nitrate, 10 per cent solution of protargol, 25 per cent solution of argyrol, 1–2000 solution of corrosive sublimate.

In a symposium[4] on the prophylaxis of ophthalmia in the new-born, Stedman Bull states that notification is compulsory already in thirteen states of the American Union, including the State of New York. Nevertheless, he knows that in New York City the law is honoured as much in the breach as in the observance. Bull recommends that failure by a midwife to at once notify the disease should be punished by a heavy fine for a first offence, and forfeiture of licence for a second. He prefers the 1 per cent. solution of silver as unlikely to do harm in careless hands. Though the disease now and then appears even after skilled prophylaxis, assiduous treatment will save the eyes.

Edgar favours early notification of births (within thirty-six hours), and the insertion, on the birth certificate form, of a notice directing the physician and midwife to employ some efficient preventive measure. Edgar has been struck by the frequency with which ophthalmia occurs in the practice of some physicians, and he has found the disease to be not too rare in some maternity hospitals.

Krauss, of Philadelphia, has known cases in which the practitioners have directed " mother's milk " to be dropped into the eye at intervals, as a cure for ophthalmia ! Some plain speaking by Stephenson[5] and others, indicates that occasional careless and inadequate treatment is by no means a Transatlantic monopoly. Krauss advises cleansing of the parturient tract in a suspected case with mild antiseptic douches, which can do no harm to the baby's eyes. As soon as the head is born, the eyelids are to be wiped with dry gauze, then with gauze wet with boracic lotion (10 gr. to the ounce). When the cord is tied, the lids should again be wiped, and the conjunctival sacs flushed with the lotion. If a maternal discharge is present or suspected, a drop of 2 per cent solution of silver nitrate is to be placed in each lower conjunctival sac. If too much nitrate enters, it should be at once neutralized with normal saline solution or the boric lotion. Late infection is caused by the transference of the virus to the infant's eyes by means of the fingers of the mother* or nurse, or by contact with soiled clothes.

If the disease appears, **Boric Lotion** should be freely used every hour day and night, after carefully separating the lids. The physician must apply 2 per cent **Silver Nitrate** to the everted lids and the fornices once or twice a day according to the amount of the discharge. The nitrate may be painted on with a small brush or swab, and is to be at once neutralized with normal salt solution. A recrudescence may occur if the silver treatment is stopped too early. Intermittent **Ice Compresses** are of value in the early stage of the disease, but the vitality of the cornea is threatened when they are recklessly employed. Later, hot compresses, for a short time daily, prevent the lids from sticking, encourage the escape of discharge, and even seem to help in clearing up corneal opacity. Krauss favours the instillation of 20 per cent **Argyrol** after each wash-out, as being a mild and constant antiseptic bath, and, if there is corneal haze, he excludes all bright light, and places a drop of ½ per cent **Atropine** solution in the affected eye twice or thrice daily.

Harman's[6] figures show that scrupulous cleanliness without the use of solutions of silver nitrate or mercurial salts, except for suspected cases, has better results than the routine employment of these antiseptics. His explanation of this apparent paradox is that the indiscriminate employment of antiseptics, especially of 2 per cent silver nitrate, will injure some eyes, and will occasionally encourage slovenly practice.

That the disease, when it appears, is not more often communicated to others is both fortunate and surprising. The mother probably, as Harry[7] suggests, is immunized ; and Harman's case, in which the ophthalmia was transferred from the infant to four other members of the family, including the mother, must be regarded as exceptional.

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* V. Herff detected a mother, who had a gonorrhœal discharge, stroking the right cheek of her 7-days-old baby. Two days later, the infant's right eye showed unmistakable evidence of infection. See *Centr. f. Gyn.* Nov. 14, 1908.

Stephen Mayou[8] thinks that the baby's eyes are commonly infected at the first washing. He points out that a purulent mucocele, due to congenital obstruction of the lacrymal sac may be mistaken for ophthalmia, but that the diagnosis is clear when (1) pressure over the sac causes regurgitation into the eye, and (2) the condition is unilateral.

The scheme, instituted by Nimmo Walker,[9] of admitting mother and child to the St. Paul's Eye and Ear Hospital, Liverpool, so as to combine the advantages of breast feeding and nursing with constant care of the infant's eyes, is working very successfully.[10] Wendell Reber[11] states that a similar method is employed at the Philadelphia General Hospital. Harry[12] finds that when babies suffering from ophthalmia are admitted alone to the Leeds General Infirmary, they fare worse than when the mothers come in with them. He seldom employs solutions of the mercurial salts, and altogether discards the biniodide, to which he is inclined to ascribe some cases of pallor, salivation, and gastro-enteritis.

V. Herff[13] has had remarkable success with **Sophol** (formonucleinate of silver) as a prophylactic. Ophthalmia has only occurred in two out of a total of 4,500 infants, and one of these was a late infection (ninth day), in which only one eye was implicated. The sophol (5 per cent), dropped into the conjunctival sac every three hours, cleared up the eye entirely in five days.

Scipiades' experience[14] with 1 per cent **Silver Acetate,** in Tauffer's clinic in Budapest is almost as favourable as that of v. Herff with sophol. Scipiades does not flush out the sac after dropping in the acetate, for although he agrees with Lockermann that free acetic acid is produced on contact with the tears, this is decidedly less caustic than the nitric acid formed when the nitrate is instilled. Scipiades, moreover, questions the neutralizing property claimed for saline solution by Thies and Zweifel, and states that it actually favours the production of "silver catarrh."

The extra-ocular complications of ophthalmia in infants are fortunately rare. Leslie Buchanan[15] describes a case of multiple arthritis. A month after birth (when the inflammation of the eyes had almost disappeared), swellings were noticed on the joints of a finger, a toe, and in one palm. These were all opened and the pus evacuated. The gonococcus was detected. The child's condition rapidly improved, and eight months later the joints which had been opened were in every way normal.

Chronic Conjunctivitis.—The circumcorneal or "catarrhal" ulcers sometimes found in the chronic conjunctivitis of old people are usually held to be due to traumatism and subsequent infection. Brown Pusey[16] brings forward a new theory of their genesis. He considers that the epithelial cells of the limbus are stimulated to proliferate by the toxin of the organism (usually the diplobacillus of Morax-Axenfeld), and that necrosis of the central cells causes the production of an ulcer. The theory is certainly supported by the usually clean and uninfiltrated appearance of the ulcer, and by the fact that several ulcers may stud the corneal rim.

PLATE XXXV

VOLUMINOUS SARCOMA OF CONJUNCTIVA

From photographs taken on January 17, and January 26, 1908, showing the remarkably rapid extension of the growth

Phlyctenular Conjunctivitis.—In this disease Darier[17] has found a course of **Massage with Ointment of Guaiacol** (1 per cent) of value, where yellow ointment has failed. The internal administration of guaiacol for the purpose of reducing high temperatures by diaphoresis has sometimes caused alarming symptoms of collapse.[18] In ophthalmic practice, the drug has been applied to the skin[19] with distinct benefit in irido-cyclitis and sympathetic ophthalmia, and free diaphoresis obtained without any signs of depression. The weak ointment employed by Darier is therefore probably quite safe, even when used on very young patients.

Sarcoma of Conjunctiva.—A case of voluminous sarcoma of the conjunctiva is reported by Roy, of Montreal,[20] in a boy of six years. At the first consultation (January 12th, 1908), the tumour was seen to be attached by a broad pedicle to the superior cul-de-sac. Except for some restriction of movement, the eye itself was normal. A piece of the growth was examined microscopically, and found to be a round-celled sarcoma. The orbit was exenterated on January 26th. A comparison of the photographs (*Plate XXXV*) from the *Montreal Medical Journal*, is interesting, as showing the remarkable enlargement which took place in a fortnight. Dr. Roy mailed on October 8th, 1909, " Up to date there has been no recurrence."

Trachoma.—Since Sattler in 1882 described his diplococcus, many other investigators, including Koch, Noiszewski, Burchardt, Raehlmann, and L. Müller, have claimed the discovery of the cause of trachoma. Not one of these organisms, however, has been able to establish its specificity, and, as late as 1906, Addario, at the Palermo Congress, declared that the contagium vivum of the disease had not yet been isolated.[21]

In the following year, interest was excited by a paper, in which Halberstädter and v. Prowazek[22] published an account of certain cell-inclusions (zelleinschlüsse) and granules (körnchen), which they had repeatedly found (while engaged on the Syphilis Commission in Java, in 1906) in the conjunctivæ of trachomatous natives, and of orang-utans upon which trachoma had been successfully inoculated. Stained by the Giemsa method, the granules appeared red in a blue field. The latter, thus differentiated from the rest of the cell, the observers regarded as a reaction product to the presence of the granules, which they held to be organisms of a protozoal rather than a bacterial nature, and to which the name of chlamydozoa or mantelthiere was applied, since the einschluss was seen, at least at one stage, to form a cap or hood to the cell nucleus. Shortly afterwards, Greeff, who, in collaboration with Frosch, Clausen, and others, had long carried out investigations into the cause of the disease, substantially corroborated the findings of Halberstädter and v. Prowazek.

The specificity of this organism, if organism it be, remains to be proved. Meanwhile, Schmidt-Rimpler, bearing in mind previous " discoveries," deprecates the over-confident assumption that the " trachomerreger " has indeed been found at last. The granules, or

"bodies," which resemble very minute cocci, are seen in *Figs.* 17 and 18.

Treacher Collins[23] regards trachoma as essentially a chronic disease, often complicated by a mixed infection. The cure is not a matter of weeks, but of months, it may be years. In the production of pannus there are, in Collins' opinion, two factors, viz., irritation by a roughened lid, and real infection of the cornea with trachoma. In the treatment of pannus he has found **Jequiritol** (Merck's extract of abrin) of much value. The amount of reaction wished for is usually produced by one

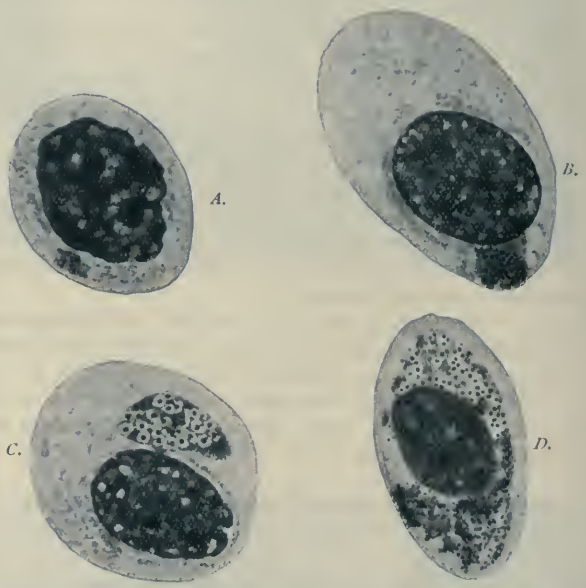


Fig. 17.—Experimental Trachoma in the Orang-utan. The figures show, progressively, the cell-change due to multiplication of the granules. The large, dark, ovoid body is, of course, the nucleus.

(*Berl. klin. Woch.* June 14, 1909. "*Zur Aetiologie des Trachoms*," by L. Halberstädter and S. v. Prowazek).

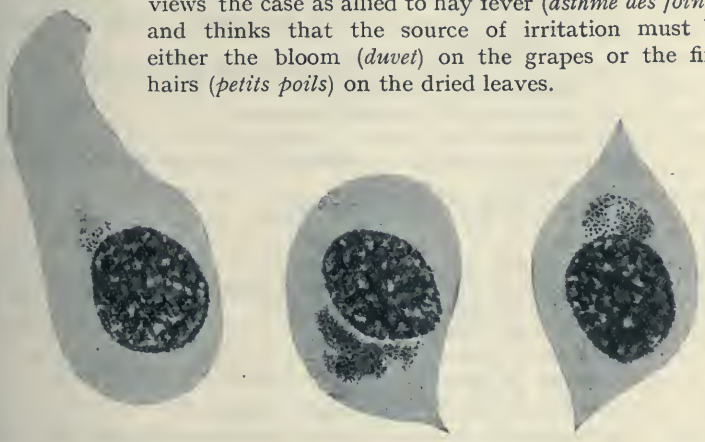
application of the remedy in its strongest solution without the need of antiabrinic serum.

Thielemann, of Königsberg,[24] has cured many cases of trachoma by means of **Radium.** He applies a glass tube containing 2 mgrams of pure radium to the everted lid for from five to ten minutes, two or three times a week. A cure is sometimes obtained in a month.

Selenkowski,[25] too, speaks favourably of this form of treatment. He uses a glass tube containing 10 mgrams of radium bromide for five or ten minutes twice a week. Three months may elapse before a cure; but treatment for from one to two months often suffices.

Vintage Conjunctivitis.—Villard[26] records an uncommon form of conjunctival inflammation in a man of 45 who worked in a vineyard.

When the grapes were ripe, the eyelids became red and swollen, and the conjunctiva injected. There was, too, a profuse watery discharge from the eyes and nose, accompanied by a good deal of malaise. On leaving his work in the evening the symptoms and signs abated, to recur, however, the next day when he entered the vineyard. Villard views the case as allied to hay fever (*asthme des foins*), and thinks that the source of irritation must be either the bloom (*duvet*) on the grapes or the fine hairs (*petits poils*) on the dried leaves.



A. *B.* *C.*

Fig. 18.—Trachoma Bodies.—*A*, Early stage. In *B*, *C*, the bodies are commencing to cap the nucleus.

(*Jour. Amer. Med. Assoc.* July 3, 1909. "Trachoma Bodies," by Brown Pusey, M.D.).

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CONSTIPATION.

Robt. Hutchison, M.D.

Hertz[1] gives the following classification of the causes of constipation :—

I. Slow Passage through the Intestine.

A. *Deficient motor activity.*

1. Inefficient intestinal muscles.
   (*a*). "Constitutional."
   (*b*). Senile.
   (*c*). Anæmia, especially chlorosis.
   (*d*). Cachexia of tuberculosis and cancer.
2. Depression of central and peripheral nervous system, resulting in diminution in the response to stimuli which normally produce peristalsis.

(*a*). Functional.
(i). Neurasthenia, hypochondriasis, melancholia.
(ii). Old age.
(*b*). Organic.
Tabes.

3. Insufficient stimulation of peristalsis.
(*a*). Too little food.
(*b*). Food containing too little indigestible residue or chemical stimulants.

4. Stimulation of sympathetic nerves inhibiting peristalsis.
(*a*). Reflex from painful organ.
(*b*). Irritative stage of lead poisoning.
(*c*). Peritonitis.

5. Paralysis of sympathetic inhibitory nerves permitting irregular peristalsis.
Paralytic stage of lead poisoning.

B. *Obstruction.*

1. Dry, hard fæces.
(*a*). Resulting from fæcal retention, brought about by any of the other causes of constipation.
(*b*). Too little water.
(i). No thirst.
(ii). In women to diminish frequency of micturition.
(iii). Replaced by alcohol.
(*c*). Excessive secretion of urine—diabetes.
(*d*). Excessive secretion of sweat—after hard exercise and in hot weather.

(2) Diminished lumen of alimentary canal.
(*a*). Congenital or acquired stricture, including growth: œsophagus, pylorus, intestine, anal.
(*b*). Pressure from outside.
(*c*). Kink (?)

II. Inability to Defæcate (Dyschezia).

A. *Loss of defæcation reflex.*
B. *Atonic dilated rectum and sigmoid flexure.*
A and B generally together due to habitual disregard of call to defæcation, owing to sloth, modesty, or fear of pain from piles, fissure, or other pelvic disease.

C. *Atony or paralysis of voluntary muscles concerned in defæcation.*
1. Abdominal muscles.
(*a*). Organic paralysis.
(*b*). Weak from repeated pregnancies, etc., associated with visceroptosis.
2. Pelvic floor muscles, which are liable to be injured during parturition.
3. Diaphragm.

He defines constipation as a condition in which none of the residue of a given meal is excreted during the ensuing three days. In doubtful cases in which it is thought that a patient may be constipated, although his bowels are opened every day, two or three charcoal lozenges should be given one morning with breakfast. If none of the fæces passed during the next three days are coloured black, the patient may be considered constipated. In order that the bowels may act

regularly, that is to say in order to avoid constipation, the passage of the food through the alimentary canal should in the first place be at the normal rate, and secondly, when the fæces have reached the rectum they should be excreted normally. There are two great classes of constipation : those cases which are due to the slow passage through the alimentary canal, and those which are due to inability to defæcate completely. To the latter class he applies the term " dyschezia." The majority of cases of very severe constipation, such as those in which the bowels may not be open for several weeks, are examples of this condition, so that ileosigmoidostomy, with or without colectomy, which has recently been proposed as treatment for constipation, would clearly be useless, as it would remove a normal colon without curing the inability to defæcate. The inability is due to one of three causes : (1) Loss of the defæcation reflex ; (2) Atonic dilatation of the sigmoid flexure and rectum ; or (3) Atony of the voluntary muscles employed in the act of defæcation. The first two of these frequently go together, and they originate in the voluntary disregard of the call to defæcation. This is particularly frequent in girls and women, in whom it is due to false modesty or to laziness. It is sometimes due in both sexes to fear of defæcation on account of the pain incurred in the act, owing to the presence of piles, anal fissure, or other disease in the pelvis. In time a patient, who voluntarily disregards the call to defæcate, allows the fæces to accumulate so frequently and in such large quantities in the rectum and sigmoid flexure that the defæcation reflex becomes impaired. The sensitiveness of the mucous membrane is so blunted that these patients frequently say they have no desire to defæcate, even though it is found by digital examination that the rectum is distended with fæces. The accumulation of fæces distends the rectum and the sigmoid flexure, which consequently become atonic and paretic, so that defæcation is finally impossible.

Kisch[2] considers that *spastic constipation* is often a sign of a general nervous state, the expression of a hyper-sensibility of the intestinal nerves. Treatment must first be directed to the nervous system, and then to the intestine itself. He advises a simple, light, nutritious diet, avoiding all articles of food which distend or irritate the bowel. Mild **Faradization** and **Warm Applications** are useful ; massage is injurious. **Belladonna** is of great value ; it should be given in considerable doses.

Boas,[3] on the other hand, denies altogether the existence of spastic constipation as a special variety. Ordinary atonic constipation in a nervous individual may produce exactly the same symptoms. Nor is the shape of the stools or the existence of palpably contracted coils of bowel conclusive, for these signs also may be met with in all forms of intestinal disorder.

Lipowski[4] is of opinion that chronic constipation is frequently due to an increased capacity on the part of the colon for the absorption of water. He recommends treatment by means of **Paraffin** of melting point at about 38° C. This is liquefied by heat, and 8 oz. are injected at bedtime by means of a soft rectal tube introduced for a few inches.

The paraffin is left in over-night and acts by softening the fæces and lessening the absorption of liquid. He claims that paraffin has many advantages over oil for these purposes.

REFERENCES.—[1]*Clin. Jour.* Aug. 5 1908; [2]*Med. Klin.* 1908, No. 20 (abstr. *Centr. f. inn. Med.* Dec. 12, 1908); [3]*Ibid.* No. 1908, 39 (abstr. *Ibid.*); [4]*Berl. klin. Woch.* July 19, 1909.

CONVULSIONS, INFANTILE. *Prof. G. F. Still, M.D., F.R.C.P.*

The causes of convulsions in infancy are stated by McKee[1] to be. (1) Neurotic inheritance. Insanity, imbecility, epilepsy, hysteria, syphilis, alcoholism, and tuberculosis all play their part in determining the occurrence of convulsions in the offspring of persons suffering with any of these diseases; possibly gout in the parents may also be a factor. (2) Intra-uterine affections of the brain or circulatory apparatus. Such conditions as porencephaly and agenesis corticalis in an infant are likely to cause convulsions; congenital heart disease is also sometimes a cause. (3) Causes operative at birth, for instance, asphyxia neonatorum, or trauma from difficult labour. Hæmorrhage, either meningeal or cerebral, or damage from direct violence during birth, may not cause convulsions immediately; the first convulsive attack may be as late as three months after birth. (4) Causes operating after birth, such as the various infective diseases of the newly born, and the hæmorrhagic conditions at that period. (5) Rickets. This, according to McKee, is the commonest of all the causes of convulsions in infancy; but it is rather a predisposing than an exciting cause. The exciting causes are legion: undigested food in the bowel, worms, dentition, adenoids, an adherent prepuce or clitoris, even vaccination: any of these is sufficient cause in a rachitic child. (6) The diarrhœal diseases, especially the infective variety, may, by inducing a toxæmia, especially in the late stage of the disease, when the condition known as "spurious hydrocephalus" has supervened, start a convulsive attack. (7) Organic diseases of the nervous system, viz., meningitis, cerebral tumour, hydrocephalus, polio-encephalitis, and occasionally poliomyelitis. (8) Infectious fevers, in which convulsions are sometimes an initial symptom from toxæmia, and sometimes a late symptom from complications, such as ear disease and meningitis. McKee dissents from the view commonly held that convulsions in infancy and childhood often replace the rigors of the adult. (9) Nephritis is sometimes associated with convulsions at its earliest stage, but occasionally a chronic nephritis, after lasting a long time induces convulsions by a condition of uræmia. (10) Severe hæmorrhage. Anæmia of the brain from this cause may excite a convulsion. (11) Poisons, such as lead, strychnine, etc. (12) Embolism and thrombosis, the former secondary to valvular disease, the latter in association with marasmus, syphilis, or middle-ear disease. Lastly, the convulsions of infancy and early childhood may be the first appearance of true epilepsy.

Turner,[2] of Brisbane, states that no less than 20 cases of lead-poisoning are admitted to the Children's Hospital of that city annually,

and that convulsions of a severe type, and not infrequently fatal, are due to this cause. The source of the plumbism is the general use of white lead in painting the wooden houses of Queensland; the hot sun quickly reduces the paint to a powdery condition, and children, playing for instance on a wooden verandah painted thus, are very apt to get the powder on their fingers, and unconsciously convey it into their mouths. (*See also* EYE MUSCLES, AFFECTIONS OF.)

Starke[3] reports two cases, one in a boy of 3 years, the other in a boy of 13 years, where calomel was thought to be the cause of convulsions. In the former case one grain had been given, in the latter also one grain was sufficient to start convulsions. This result is of course very exceptional, and due, so Starke thinks, to a peculiar idiosyncrasy.

TREATMENT.—McKee (loc. cit.) says that he knows of no therapeutic agent more uniformly dependable than **Chloroform.** Whilst the child is under the influence of the chloroform it is well to wash out the bowel by **Irrigation** with normal saline solution. **Stomach-washing** is advisable in some cases. **Calomel** is to be given in sufficient dose to ensure clearance of the intestine. **Chloral** should be given per rectum in starch enema; it is better given thus than by mouth; the **Bromides,** however, may be administered orally. Acetphenetidin, better known as **Phenacetin,** is recommended by McKee. **Bleeding** has proved valuable, and the same writer suggests that it should be followed by hypodermic infusion of saline solution. **Oxygen Inhalation** is of value, particularly where the convulsions are associated with asphyxia. **Lumbar Puncture** is advised by McKee when there is evidence of increased intracranial pressure, for instance in meningitis and in hydrocephalus; but it has also been thought beneficial in uræmia. Weil[4] recommends the use of chloroform inhalations immediately an attack of convulsions occurs, and says it may be given even to infants of two months old. Even to very young children he would give bromide in large doses.

REFERENCES.—[1]*Ther. Gaz.* Mar. 15, 1909; [2]*Brit. Med. Jour.* Apr. 10, 1909; [3]*Pediatr.* Mar. 1908; [4]*Jour. de Méd.* in *Pediatr.* Feb. 1908.

CORNEA, DISEASES OF. *A. Hugh Thompson, M.D.*

Interstitial Keratitis.—The cause of this disease in the great majority of cases is well known to be congenital syphilis. Stephenson[1] found evidence of the connection in 70 out of 101 cases. In a proportion of the remainder it was probably present. Yet there are a certain number of cases in which congenital syphilis is not the cause. A few are due to acquired syphilis; and with regard to these it has been noted that they are comparatively mild cases, often confined to one eye, and peculiarly amenable to antisyphilitic treatment. Tubercle is also said to be a cause of interstitial keratitis, but nothing very definite is known about the connection. The same may be said of malaria and other generalized infections. As to the pathology of syphilitic cases, it is an interesting fact that the *Spirochæta pallida* has been found in the corneæ of rabbits artificially infected with syphilis. It

has been found in the various tissues of the eye of the syphilitic fœtus. If has not been found, so far, in the cornea of the patient with interstitial keratitis, but this may be merely because such corneæ do not in the ordinary way come to the pathological laboratory. Stephenson concludes that, in the case of the syphilitic child that survives, the spirochætes may lie dormant, possibly in some intermediate morphological form, in the cornea, iris, choroid, etc. "They cause no mischief until some determining cause, of a local or general nature, lowers the resistance of the tissue, and allows the treponema to get the upper hand. The result is an attack of interstitial keratitis, of iritis, or of choroiditis, as the case may be." The age-incidence of 97 cases of this disease was found by Stephenson to be as follows: 1 to 5 years, 6;' 5 to 10 years, 38; 10 to 15 years, 26; 15 to 20 years, 14; 20 to 25 years, 8; 25 to 30 years, 2; over 30 years, 3.

Diagnosis.—Too much stress cannot be laid on the teeth as a help to the diagnosis of congenital syphilis.[2] The central upper notched incisors of Hutchinson are well known, but there are other defects not

Fig. 19.—Milk canines in which a discoloured blunt peg projects from a base of normal-looking tooth tissue.

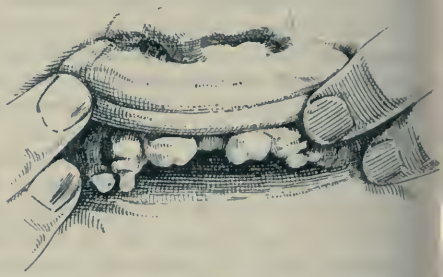

Fig. 20.—Girl, aged 8 years, subject of interstitial keratitis. Note characteristic permanent incisors and equally characteristic temporary canines. This girl also has well-marked Fournier molars.

so often looked for. One, described by Hutchinson himself, is a deficiency of enamel in the milk canines. "A central discoloured blunt peg (*Figs.* 19, 20) projects from, and is separated by a narrow groove from a base or collar of normal-looking tooth tissue." A second, described by Fournier and Darier, is a similar condition affecting the first permanent molars (*Figs.* 21, 22). The enamel on the crown of these teeth is imperfectly formed. The softer dentine grows into irregular projections, which fall an easy prey to caries. Consequently these teeth nearly always become decayed at a very early period, but as they are normally erupted at the age of six before the appearance of the permanent incisors, they may furnish a valuable help to diagnosis.

Treatment.—This is in the first place local, i.e., **Atropine** to guard against iritis, and perhaps **Dionine** to help absorption. General anti-syphilitic treatment is often considered not to help very much, but the discovery of the spirochæte has given a certain impetus to those who are inclined to push it. **Mercury** is now generally prescribed either in the form of hyd. c. cret. gr. j, t.d.s., or still better in the form

of the daily inunction of a drachm of mercurial ointment. Stephenson speaks well of **Arsenic,** and in a series of severe cases has employed intramuscular injections of **Atoxyl.** Atoxyl, however, is hardly a drug that ought now to be employed, in the light of the evidence that goes on accumulating, that it is liable to cause optic atrophy. As an

Fig. 21.—From 6-year-old child with interstitial keratitis. First permanent molar at the right is of the Fournier or Darier type.

instance of this, the following case of Coppez[3] may be quoted. A man of 54, the subject of inherited syphilis, interstitial nephritis, and cardiac lesions, received a series of injections of 5 cgrams each of atoxyl. The affection of sight began after the first injection, and

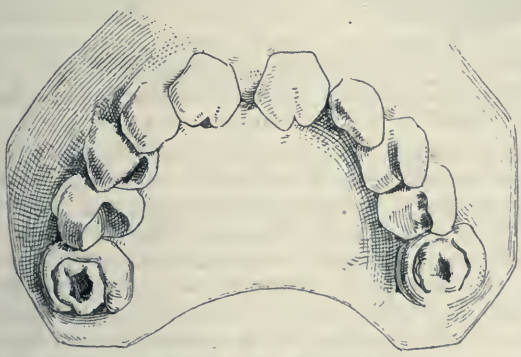

Fig. 22.—Reproduction from Darier's paper showing characteristic permanent molars with central discoloured mass crenated, instead of tuberculated.

after the fifth blindness was complete and permanent. The cause was at first not suspected, as it was not until after the sight was lost that pallor of the disc became evident. If the arsenical treatment is to be tried, it would be better to use **Soamin,** a preparation which, being free from aniline, is said to be safe from the toxic properties

of atoxyl. Coram James[4] has used the drug for this disease in the form of intramuscular injections of from 2½ to 5 gr. on alternate days until about 100 gr. have been injected. The injections may also be subcutaneous (Wray[5]) provided that the dilution is sufficient (not less than 2 dr. of water).

Hypopyon Keratitis.—A good account of this not uncommon affection is given by McGillivray.[6] Its most common cause is the pneumococcus, an organism which, besides being the cause of lobar pneumonia, is a frequent inhabitant of a diseased or obstructed lacrymal sac. So long as the corneal epithelium remains intact it cannot produce a corneal ulcer, but the least scratch to the cornea under such circumstances is liable to be followed by an infiltration, which for the first few days may be painless, but shortly breaks down and causes acute

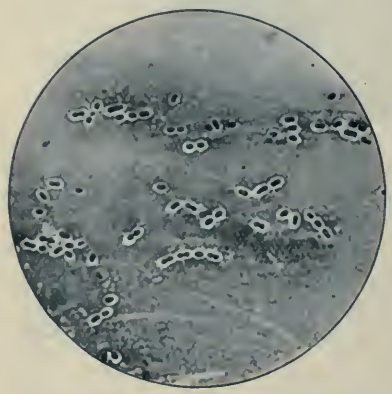

Fig. 23.—Film preparation of pneumonic sputum showing numerous pneumococci (Fraenkel's) with unstained capsules; some are arranged as short chains. Stained with carbol-fuchsin. × 1000. (From Muir and Ritchie's *Manual of Bacteriology.*)

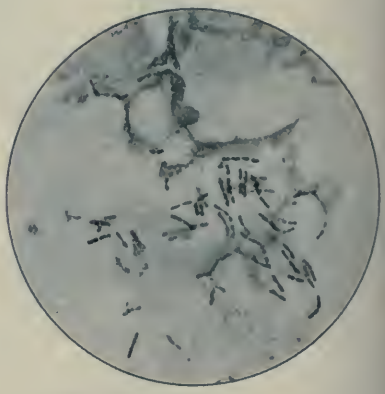

Fig. 24.—Film preparation of conjunctival secretion showing the Morax diplo-bacillus of conjunctivitis. × 1000. (From Muir and Ritchie's *Manual of Bacteriology.*)

pain, assuming the form of a crescentic corneal ulcer with an undermined margin on the side on which it is spreading, and where the infiltration is thickest. Typically there is hypopyon, ciliary congestion, and iritis. In such a case the diagnosis presents no difficulty. Not all hypopyon ulcers, however, are typical, and not all are due to the pneumococcus. According to McGillivray the next most common cause, at any rate in his district (Dundee), is the diplobacillus of Morax-Axenfeld, the organism which also causes the common form of conjunctivitis known as "angular." When an eye so affected is the subject of a corneal abrasion or phlyctenular infiltration, this is liable to become infected, producing an ulcer with hypopyon which differs in appearance from the "ulcus serpens" already described in having no overhanging margin, in being as a rule more centrally situated, more uniformly infiltrated all round the margin, and deeper, with a greater tendency to perforation. In cases of doubt it may be necessary

to make a bacteriological examination to clear up the diagnosis, a very important matter, as the treatment of these two forms of corneal ulcer is very different. The salient points in the bacteriological examination are as follows. A thin platinum loop is sterilized by passing it through the flame of a spirit lamp, and with it a tiny portion from the margin or underneath the margin of the ulcer is removed. It is spread on two cover-slips, which after being fixed by heating are stained, the one with weak carbol-fuchsin, the other by Gram's method, mounted, and examined with an oil-immersion lens. The pneumococci (*Fig* 23) appear as small (1 μ in longest diameter) oval organisms arranged in pairs or short chains, and surrounded by a capsule. They retain the stain in Gram's method ("Gram-positive"). The diplobacilli (*Fig.* 24) are relatively large (1μ by 2 μ), usually occur in pairs, are not encapsuled, and are decolorized by Gram's method ("Gram-negative").

TREATMENT.—In all cases we have to think of two things: to stop the process of ulceration, and to prevent reinfection. In the pneumococcal ulceration the most effective plan is **Cauterization,** either with pure carbolic acid or with the electric cautery. The cornea should be previously stained with fluorescein, which shows up the exact area which has to be attacked. Usually, of course, cocaine is necessary, but in the writer's experience the cornea is not infrequently anæsthetic in these cases, the nerve-endings having been destroyed by the ulcerative process. In any case, the process of healing takes time, and can only be effected by the formation of scar tissue, which leaves a permanent nebula. The second object—to prevent reinfection—may be not less urgent than the first. In all cases we must make a careful examination of the lacrymal passages and sac, and when there is mucopurulent regurgitation, the shortest way in the end is to excise the lacrymal sac. In the case of ulcers due to the diplobacillus, it is never necessary to cauterize, as this organism is easily killed by **Zinc Sulphate,** which should be instilled into the eye in the form of a one-half per cent solution as often as every hour in bad cases. In addition to these measures, we must of course ensure rest to the eye, and ward off iritis by atropine, hot fomentations, and bandages. Numerous other methods of treatment have been advocated from time to time, and an antipneumococcic serum has been introduced and extensively employed by Römer, concerning which McGillivray justly remarks that it has not given the results one might have expected.

McKee[7] also testifies to the frequency of corneal ulcers caused by the Morax-Axenfeld diplobacillus. Of 41 consecutive cases in his practice at Montreal he found no less than 21 due to this cause. Generally, the attack was mild and without hypopyon; but it is now known, he says, that the diplobacillus can give rise to ulceration as severe in type as the ulcus serpens of pneumococcus infection. The importance of bacteriological examination lies in this, that in pneumococcus ulceration we have an exceedingly virulent process to combat; in diplobacillary infection we have a pathological condition easily controlled and cured.

Neuropathic Keratitis.—This term, says Verhoeff,[8] includes any lesions of the cornea due to disturbance of its nerve supply. The value of the term is that it groups together several conditions which have been separately described and are not always recognized as being related to each other. All the following conditions are included: herpes zoster of the cornea, herpes febrilis of the cornea, dendritic keratitis, superficial punctate keratitis, filamentary keratitis, neuroparalytic keratitis, and traumatic relapsing erosion of the cornea; possibly there are others. In the case of herpes zoster of the cornea, this has been proved by Head and Campbell to be due to an irritative lesion of the Gasserian ganglion, transmitting an impulse along the fifth nerve. The question, therefore, Can efferent impulses be transmitted along nerve fibres which are normally afferent in function?—may be answered in the affirmative. And this makes it easier to suppose that all the before-mentioned conditions are due to abnormal impulses or the absence of normal impulses transmitted by the corneal nerves. Clinically, there are two facts which lead us to suppose that there is such an underlying cause common to all these conditions: (1) They are very apt to be more or less associated with each other, and (2) In all these conditions there is apt to be a diminution in the sensitiveness of the cornea. This is best tested by touching the affected cornea with the cut end of a thread, and comparing both the sensibility and the lid reflex with those of the other cornea. In some cases the corneal lesions may be so slight as to be easily overlooked, and here the fluorescein test is useful: the intense stain which is produced by actual erosions is evident, but besides this there is a slighter staining which is not due to actual erosion. In these cases the epithelium is more permeable than normal over the infiltrated spot, and if the fluorescein, instead of being washed away immediately by boracic lotion, is allowed to penetrate for a minute or two first, a corneal lesion of this nature is distinctly, though lightly, stained.

Treatment.—Verhoeff argues that as the lesions are due to irritation of the corneal nerves, they are best treated by local anæsthesia applied to the nerve terminations. Theoretically, since the cornea is already partially anæsthetic, this would seem to be a policy of doubtful wisdom, especially as cocaine is well known to act prejudicially to the nutrition of the cornea, and certainly in cases where the anæsthesia has already advanced far, and also in cases of dendriform ulcer, it is scarcely applicable. In more than 100 cases where the subepithelial staining with fluorescein was present, however, Verhoeff employed local anæsthesia with benefit; the drug he uses is **Holocain,** a one per cent watery solution instilled into the conjunctival sac every two hours. This treatment is combined with **Bandaging,** and in cases of threatening iritis with **Atropine.** Many cases relapse, however, and for any case in which some specific general treatment is not indicated it is well to prescribe a nerve tonic—**Arsenic** in the form of liquor arsenicalis 2 min. t.d.s., the dose being daily increased until it reaches 10 min. Symptoms of arsenical poisoning must of course be watched for.

In some cases of dendriform keratitis one can watch the process of infiltration spreading from day to day, and in the writer's experience no treatment is so beneficial in stopping this process as the application of pure **Carbolic Acid.**

REFERENCES.—[1]*Ophthalmoscope*, Feb. 1909; [2]Gifford, *Jour. Amer. Med. Assoc.* July 3, 1909; [3]*La Clin. Ophthalmol.* in *Ophth. Rev.* Sept. 1909; [4]*Folia Therap.* July, 1909; [5]*Brit. Med. Jour.* July 24, 1909; [6]*Edin. Med. Jour.* July, 1909; [7]*Montreal Med. Jour.* Feb. 1909; [8]*Jour. Amer. Med. Assoc.* July 17, 1909.

CORYZA, ACUTE (Common Cold). *Robt. Hutchison, M.D.*

ETIOLOGY.—Allen,[1] from an elaborate investigation into the bacteriology of coryza, concludes: (1) It has been shown that there are at least five organisms capable of producing an attack of acute nasal catarrh, viz.: (*a*) The *Bacillus influenzæ;* (*b*) The *B. septus;* (*c*) The *Bacillus of Friedländer;* (*d*) The *Micrococcus catarrhalis*; and (*e*) The *M. paratetragenus.* (2) These may be present in the naso-pharyngeal space in a certain percentage of cases which exhibit no pathological features; increase of virulence and lowered resistance of the tissues may then light them up into activity. In other cases the infection is one from without. (3) Each organism produces its own type of cold, and a differential diagnosis of the organism is possible from a consideration of the clinical features; this is more difficult should the infection be a multiple one. (4) This differential diagnosis is of considerable value both in prognosis and in treatment. (5) Chronic nasal catarrh is probably always due to infection by the bacillus of Friedländer, unless the Eustachian tube and middle ear be involved by the *Micrococcus catarrhalis;* chronic tracheal catarrh to infection by the *M. catarrhalis* or *M. paratetragenus* to which secondary infection by staphylococci, streptococci, pneumococci, and other pathogenic organisms may be superadded. (6) For infection, local defect of opsonin and for cure increase of opsonin are probably necessary conditions. (7) By means of the injection of the corresponding bacterial vaccines an attack of acute cold due to any given organism or organisms can be considerably shortened and complications be probably prevented. (8) In a similar manner chronic infections may be cured. (9) By injection of the vaccines of the several organisms in appropriate doses and at appropriate intervals considerable, if not complete, immunity against future attacks of acute cold may be secured. In those who are very susceptible and fall victims to every epidemic that may occur, the best procedure probably is systematic immunization every four to six months against all the "cold" organisms and special immunization against the particular organism or organisms responsible for the appearance of subsequent epidemics against which protection is desired.

TREATMENT.—*Preventive*: Attention to the general health is of the first importance. Fresh air, good ventilation, and the avoidance of crowded, overheated, and dusty places are essential. The face, neck, and chest should be sponged with cold water every morning. As far

as possible a patient suffering from a cold should be isolated from close contact with other people.

Abortive: A cold having been caught, the attempt to abort it is made by draining the blood-vessels (catharsis, sweating) and thus relieving the local congestion, or by dilating the peripheral circulation and thus relieving tension, or by locally treating the inflamed mucous membrane either by astringents, by vasoconstrictors, or by drugs that dry up the mucous secretion. During this first and acute stage of acute colds, and especially of coryza, various drugs and methods are used to further the indication for the relief of the local blood-tension and the congestion of the local mucous membrane.

In four recent issues of the *New York Medical Journal* (Oct. 31, Nov. 7, Nov. 14, and Nov. 21, 1908)[2] sixteen physicians have outlined what they considered the best treatment to abort colds. It is interesting to note that of the sixteen, fourteen advised the use of Dover's powder, and two morphine. Four only advised a coal-tar product and then acetphenetidinum (phenacetin). Three advised Turkish baths, seven a hot foot-bath, one a hot sitz-bath, two hot lemonade, and two alcohol, presumably in some hot liquid. Five would give aconite, one veratrum viride, and six would give quinine. One administers castor oil, three give calomel in one dose, two give calomel in divided doses, and one follows the calomel with a saline. Three would give salines alone. Sweet spirits of nitre or a nitrate was advised by five. Atropine was advised by four, belladonna by three. Locally, suprarenal extract in some form was advised by four, and various sprays containing camphor, menthol, etc., were advised by six physicians. Later, various sprays or washes, among which may be mentioned Dobell's solution, Seiler's tablet solution, or boric acid solution, were recommended.

It is thus seen that the method of depletion of the blood-vessels and the relief of local congestions most advised is that of **Sweating.** Theoretically, the best means to produce this kind of a sweat is by the Turkish bath or by hot-air treatment, the body baking as it is termed. The next best would be a hot bath, after which the patient is put to bed, with hot lemonade or other hot drinks, with or without alcohol, as deemed advisable. Most patients will not bother, however, with such treatment, and substitutes, as hot foot-baths and hot sitz-baths, are more likely to be employed; if these methods are not used, and even with these methods, Dover's powder in dose of 0·6 gram (10 gr.), as the patient goes to bed, is certainly good treatment.

Quinine, though largely used by the laity to abort a cold, is open to the objection that it tends to favour hyperæmia of the middle ear and so to predispose it to infection.

Preference should be given to **Inhalations**; aspiration of vapours of ammonia, eau de Cologne, tincture of iodine, menthol.

Brand advises:—

R	Phenic acid			Proof spirit	℥ij
	Liq. ammonia	ää ℥j		Water	℥iv

A few drops on blotting paper, inhaled several times during half a day.

Abortive powders are more active :—

R	Cocaine	gr. x	Salol	
	Menthol	gr. v	Boric acid	āā ʒiv

A pinch of the powder snuffed up every hour.

Or :

R	Salol	ʒij	Tannin	gr. xv
	Salicylic acid	gr. xv	Boric acid	ʒj

Irrigation of the nasal fossæ succeeds very well in cutting short rhinitis, but it requires some patience on the part of the patient, as it is rather disagreeable at the beginning. A tablespoonful of chlorate of potash or boric acid is dissolved in warm water, previously boiled, and passed through the nares by means of Weber's syphon or the douche of Esmarch. The patient should not expose himself to the cold air for two or three days after the irrigation.

An excellent practice is to paint the mucous membrane as high up as possible, with a solution (1–10) of cocaine and glycerin.

Curative.—Spira[3] strongly recommends **Adrenalin Inhalant** (consisting of one part of adrenalin hydrochloride to 1000 parts of a neutral oil basis with 3 per cent chloretone) in all acute cases, especially of " dry " catarrh. It should be used as a spray two or three times a day, or the nasal mucous membrane be painted with it by means of a probe enveloped in wadding. If the head be very " stuffy," aspirin should be given internally in conjunction with the above measures.

Lowry[4] has found great benefit from 10 per cent solution of **Protargol,** which is sprayed into the anterior nares, or applied by means of a fine camel's-hair brush to all parts of the nasal mucosa. This remedy suffices for all early cases, one or two applications of the solution being usually sufficient. When the case is advanced, the brushing must be repeated several times a day, or tampons soaked in the protargol solution must be inserted into the nostrils, He has used the solution with success in old cases of rhinitis, and has found it answer excellently in the majority of cases. Where the solution is not well tolerated he employs a mixture of camphor and menthol (four parts menthol and one part camphor). A few drops of this heavy oily liquid are added to a small amount of water in a test tube, which is heated over a spirit lamp. The patient holds the tube under his nostrils, and draws the vapour into the anterior nares, taking care that the liquid does not spurt. Another mixture he employs is **Oleum Menth. Pip.** in alcohol and water, equal parts, which is similarly inhaled. Internally he gives his patients 15 gr. of aspirin. Above all he urges them to inspire and expire with the mouth wholly closed, and he lays stress on the importance of nasal respiration in the treatment of chronic cases.

References.—[1]*Lancet,* Nov. 28 and Dec. 5, 1908 ; [2]Quoted from *Jour. Amer. Med. Assoc.* Jan. 16, 1909 ; [3]*Laryngology,* Feb. 1909 ; [4]Quoted in *Hosp.* Oct. 3, 1908.

CYANOSIS (Differential Diagnosis of the Rarer Forms).

George Lovell Gulland, M.D.

T. Wood Clarke[1] summarizes and amplifies his previous observations. He excludes from consideration cyanosis due to disease of the heart and lungs. A cyanosis in which these are found to be normal, may be due to some change in the blood. This may be an abnormally high red-cell content or polycythæmia, in which case it is probably associated with an enlarged spleen and chronic constipation (Osler's disease). Or it may be due to some change in the blood pigment itself, with a normal blood-count. If the abnormal pigment be methæmoglobin (the commonest), the condition may be due to drug poisoning, or auto-intoxication by the absorption of nitrites from the intestines in cases of diarrhœa. The most common drug to produce cyanosis is acetanilide, which forms the basis of most of the " headache powders " in the market. Phenacetin, sulphonal, trional, potassium chlorate, and the nitrites may produce the same result. Workers in these drugs, and artisans in aniline factories, may show the same change. There are few constitutional symptoms except headache and prostration. The treatment in chronic cases consists in stopping the drug, in acute cases in lavage or emetics, fresh air, warmth, and cardiac stimulants. In the intestinal cases it is worth bearing in mind that they all occur in cases of long-standing diarrhœa; that one is apt to give bismuth subnitrate in large doses in such conditions; and that certain of the intestinal organisms can change nitrates into nitrites. A number of cases of this sort, some of them fatal, have also been reported since this drug has come into increased use in X-ray diagnosis and in tuberculous cavities: it is, of course, possible that idiosyncrasy plays a part in them.

The pigment may be sulph-hæmoglobin, and is then probably associated with chronic constipation, and is the result of the hyperformation or hyperabsorption of H_2S, or of the presence in the blood of an abnormal reducing agent, acting with a small trace of H_2S. The distinction between the two sets of cases is made by the spectroscope, the diluted blood being examined in the usual way. Either of the pigments gives a black band in the red. If this band persists when a few drops of ammonium sulphide are added to the diluted blood, the pigment is sulph-hæmoglobin; if it vanishes, it is methæmoglobin. The addition of a reducing agent, as hydrazene or phenylhydrazene, may intensify a sulph-hæmoglobin band too faint to be seen otherwise. A further distinction lies in the fact that, if a methæmoglobinæmia case be put on a pure milk diet, the cyanosis clears up in forty-eight hours, and the methæmoglobin disappears completely from the blood. The whole symptom-complex, however, reappears within four hours after a full meal. This temporary improvement does not occur with sulph-hæmoglobinæmia. The methæmoglobin cases improve as the enteritis is cured, and the sulph-hæmoglobin cases recover if the bowels are kept well open.

REFERENCE.—[1]*Med. Rec.* July 24, 1909.

CYSTS, CUTANEOUS. *E. Graham Little, M.D., F.R.C.P.*

Robinson[1] proposes to simplify the classification of cysts of the pilo-sebaceous system by recognizing only two divisions: (1) The horn-cysts, in which the lining wall consists of horn-cells; and (2) Mixed or sebum cysts in which sebum is present as well as horn-cells. The pure horn-cyst may occur; pure sebum-cysts do not exist. Of the pure horn-cyst, milium is the commonest example; of the mixed cyst, the comedo of acne vulgaris. The follicular cyst always forms in connection with the common excretory duct, never with the acinus or any part of the secretory gland, or its special excretory duct. A follicular cyst may form without general hyperkeratosis, although hyperkeratosis is more commonly present. He would refuse the term milium to any cyst containing sebaceous matter; and he regards the acne comedo as primarily a cystic formation, later invaded by micro-organisms, and not caused by these.

REFERENCE.—[1]*N.Y. Med. Jour.* June 5, 1909.

DEAFNESS. (*See* EAR, DISEASES OF.)

DELIRIUM TREMENS.

(*Vol.* 1909, *p.* 224)—Alcohol should be immediately and absolutely stopped. Circulatory failure is to be prevented, if it threaten, by cardiac tonics and stimulants. A hot bath has a sedative action, which is to be reinforced by drugs, e.g., Chloral, gr. xxx.; Potassii Bromid. gr. xx.; Aq. Chloro. f ad ℥ j; to be repeated every four hours if necessary. In violent and refractory cases Hyoscine Hydrobromid. gr. $\frac{1}{100}$ may be injected subcutaneously. The bowels are to be opened by a cathartic, such as Pulv. Jalapæ Co. ℈ j; warm drinks should be given plentifully, and the patient must be fed at short intervals.

DIABETES. *Francis D. Boyd, M.D.*

Much attention has been given to the dietetic treatment of diabetes, an excellent account of which is contributed by Janeway.[1] Several papers have appeared on the "oatmeal treatment" of Von Noorden, in which the method is lauded, but Pavy[2] unhesitatingly condemns it as not based upon scientific principles. Falta[3] contributes an important paper upon the conditions that limit the excretion of sugar in diabetes mellitus. He reduced his patients to a standard diet containing little carbohydrate, on which a minimum of sugar was excreted; various articles of diet were increased, and the effect on the urine was noted. When different articles were increased others were reduced, so that the caloric value of the diet remained the same. He found that in different cases, the articles which stimulated increased sugar production varied, and that some were much more tolerant of augmented carbohydrate dietary than of additional albumin or fat. Two cases showed a marked intolerance of fat: 200 grammes of butter added to the diet caused a sudden marked rise of the sugar in the urine. The fat seemed to stimulate the depraved metabolic process. In two cases carbohydrates were better borne than albumin, when the carbohydrate was given in moderate quantity, but if excess of carbohydrate was given, as in the oatmeal cure, all the carbohydrate was excreted in the urine. These cases seem to point a moral as regards

the suitability of the oatmeal or potato cure, or a purely protein diet used indiscriminately. Every case of diabetes must be studied on its own merits when considering the question of diet; different articles of diet will be found beneficial or harmful in different cases.

Senator[4] has experimentally studied the influence of warmth on the quantity of sugar circulating in the blood, and finds that it increases the amount, while Kohler[5] finds that cold rather diminishes the amount of glycosuria produced by phloridzin.

Rudisch[6] has found great benefit from the use of **Atropine** and **Atropine Salts** in the treatment of diabetes mellitus. The administration of atropine is followed by a reduction in the amount of sugar excreted and by an increase in carbohydrate tolerance. The treatment should be combined with the usual antidiabetic diet. It was uniformly observed that glycosuria disappeared much more rapidly under the combined form of treatment than with the customary dietetic measures alone. A patient taking atropine could tolerate an amount of carbohydrate which at once produced glycosuria if the atropine was withheld. Under the prolonged administration of atropine the tolerance for carbohydrates increased much more rapidly than under dietetic treatment alone. Atropine was administered in the form of the methyl-bromide and the sulphate. The former has the advantage of being less toxic, but its effects are not so rapid. Its cost also limits its use. The sulphate may be given in doses of $\frac{1}{150}$ gr. thrice daily, gradually increased up to $\frac{1}{20}$ gr. thrice daily. Children require a dosage proportional to their age. Large doses can be tolerated by diabetics if the initial dose has been small and the increase gradual.

Crofton[7] records a striking case of *Pancreatic Diabetes* treated by **Pancreatic Extract.** The extract was given in capsules insoluble in the stomach, to avoid the destructive influence of the hydrochloric acid upon the extract, and when the acute symptoms subsided **Secretin** was given to stimulate the damaged pancreas to do better work.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* Mar. 1909; [2]*Lancet*, Nov. 21 and 28, Dec. 12, 1908; [3]*Zeits. f. klin. Med.* 1908, Nos. 3, 4, 5, 6; [4]*Ibid.* 1909, No. 4; [5]*Ibid.* 1908, Nos. 5 & 6; [6]*Med. Rec.* June, 1909; [7]*Lancet*, Feb. 1909.

DIARRHŒA, INFANTILE. *Prof. G. F. Still, M.D., F.R.C.P.*

Morgan and Ledingham[1] have made experiments with the bacillus which they call "Morgan's bacillus"; this is only one of the many bacilli which are found in the fæces in cases of diarrhœa, and it is distinguished from others by certain fermentation characteristics. It is found occasionally in the intestine of children who have died from causes other than diarrhœa, and at times when diarrhœa is not specially prevalent; moreover, it is sometimes present in healthy children. In view of the generally accepted opinion that infantile diarrhœa is commonly caused by a milk infection, many samples of milk from feeding-bottles, and from houses where diarrhœa had recently occurred, were subjected to examination: swabs also from rubber teats and comforters were examined, but in every instance

except in one (from an infected house) this particular bacillus could not be found. It was found that when unsterilized milk was inoculated with the bacillus, this could not be recovered by the usual methods, even after six, twelve, or twenty-four hours' incubation at room-temperature. On the other hand, in sterilized milk the bacillus grew readily, and was easily recovered. This observation, though very interesting, is by no means in accordance with clinical experience; few would doubt that infantile diarrhœa is much more frequent in infants fed on raw milk than in those fed on sterilized. On the other hand, it is now well recognized that raw milk has certain bactericidal qualities which are destroyed by high temperatures.

Flies as a Source of Infantile Diarrhœa.—These authors have also experimented with the common house-fly. Some were obtained from infected and uninfected houses in Paddington, and some from a country house where no case of diarrhœa had occurred. The flies were killed with ether vapour, and crushed with a sterile rod in peptone broth. Morgan's bacillus was isolated from 9 out of 36 batches of flies obtained from infected houses, and from 1 out of 32 batches obtained from uninfected houses: no less than 5 out of 24 batches from the country source showed this bacillus, although it was known that there was no case of diarrhœa within a radius of at least two miles. These experiments confirm the belief of many that house-flies may act as carriers of infection, but they do not go far to confirm the specificity of this particular bacillus as a cause of infantile diarrhœa. The authors have also no satisfactory explanation to offer for the fact observed by Hamer, that flies persist in houses long after the diarrhœa season has ended.

Nash[2] has studied the house-fly and its relation to diarrhœa in detail; he regards flies as the principal contaminating agents of milk by depositing in it diarrhœa-producing organisms. The principal breeding-places of flies are collections of manure and of house refuse; other sources are piggeries, stables, slaughter-houses, offensive trade premises, midden privies, etc. A simple experiment showed to what extent milk may be polluted by flies. Two ordinarily clean saucers were three fourths filled with milk from the ordinary morning supply. One saucer was covered with a clean plate, the other left uncovered; both were left on a kitchen table, where flies were about. After five hours a bacteriological examination was made, and it was found that there were more than twice as many bacteria in the uncovered sample (into which two flies had already fallen) as in the covered milk. The experiment is hardly conclusive, however, as there is no evidence that the extra bacteria were introduced by the flies, but it seems, nevertheless, likely that some at least of them may have been introduced thus. Nash concludes: Epidemic diarrhœa is essentially *not* a disease of *entirely* breast-fed infants. Such conditions as a high temperature shown by the four-foot earth-thermometer, overcrowding, organic emanations, etc., will not cause fatal diarrhœa generally amongst infants so long as they are entirely breast-fed. There is a close

coincidence between the prevalence of flies and the prevalence of epidemic diarrhœa; dirty conditions exist all the year round, but diarrhœa only prevails when, in addition, the fly is present in large numbers. Flies are particularly partial to milk, whether fresh or condensed. They carry on their heads, legs, and bodies, large numbers of bacteria; they may introduce these into milk, or may carry them more directly when they settle on, or even inside, the mouths of sleeping infants.

Treatment.—Delmas[3] considers that small doses of **Castor Oil** should be given at the onset; calomel, he says, is unsuitable for infants under six months of age. Not until some days have elapsed after the onset is opium to be allowed; and if the stools are copious, **Bismuth Subnitrate** may be given in doses of 15 to 30 gr. daily; if the stools are green, **Lactic Acid** is sometimes useful in very young infants. If, from the character of the stools, it is judged that the affection is chiefly in the large intestine, **Irrigation** with boiled water containing ·5 per cent of sodium chloride is useful, and relieves any colicky pain.

Pehu[4] recommends sterilized **Gelatin** solution of 10 per cent strength. At least 12 grams of this solution must be given in the twenty-four hours; as much as 25 or 30 grams may be given. This has the advantage of being without taste or smell, and quickly causes diminution in the number of stools and in the offensiveness of their odour. The improvement is not always permanent, but if the symptoms recur when the gelatin is omitted, they can generally be checked again by repeating its administration.

Intestinal Lavage with normal saline solution is a well-recognized method for the treatment of infantile diarrhœa; but recently, irrigation with **Red Wine** has been recommended by Houssay.[5] No doubt such an irrigation must have some astringent as well as some stimulant effect, and might therefore be useful on occasion.

Almost more important than drugs in the treatment of this affection is the feeding. As Delmas (loc. cit.) says, omission of all food except boiled water for twenty-four to thirty-six hours is a good beginning. Milk, however prepared—boiled, raw, sterilized, pure, diluted, and what not—may not be tolerated. He thinks the best food is a vegetable infusion after the preliminary water diet. **Barley-water** may be given, made thus: Put one tablespoonful of pearl barley into a pint of water, boil for twenty minutes, and pass through a hair sieve. Then add sufficient boiled water to make a pint. Keep in a bottle that has been scalded, and close with a cork that has been boiled. Another useful **Cereal Decoction** is made thus: Take a tablespoonful of wheat, rye, oats, barley, maize, and bran. Lightly heat in the oven or on an iron plate, then grind in a coffee-mill or rub down to a pulp in a mortar. Stir up with a quart of water, boil, and evaporate to about half its bulk by boiling for at least two hours. Pass through a hair sieve and add water enough to make a quart. **Comby's Decoction** is another food which may be valuable in infantile diarrhœa. Wheat, pearl barley, crushed maize, dry white haricot beans, dried peas, lentils: one

tablespoonful of each is added to three quarts of water, and boiled for three hours; this is then passed through a sieve, and a little salt added. About a quart of decoction should result, and to each four-ounce feed of this a teaspoonful of rice or barley meal may be added.

Tisanes of Vegetables are sometimes useful. The following is advised by Dr. Remy:—

Carrots	1½ oz.	Dry Haricot Beans	1½ dr.
Potato	2 oz.	Dried Peas	1½ dr.
Turnips	½ oz.	Water	1 qt.

The mixture is boiled for four hours in a covered saucepan, then passed through a sieve, and the remaining fluid is again made up to the quart, and 70 gr. of salt are added. It is suggested that for infants who cannot digest milk, this vegetable decoction may be thickened with flour, potato meal, or toasted bread.

Any of these decoctions can be given for two or three days after the initial water diet; and then a little milk may be cautiously added to the decoction, and so, by degrees, the return to milk is made.

Malted Flour is said to be the food which can be given longest (four to eight days) as a substitute for milk. It is prepared thus: Rice flour is made into a clear pap; 2 teaspoonfuls of flour being added to a pint of water, and the mixture boiled gently for a quarter of an hour with stirring. It is then sweetened and cooled to 160° F. Some malt is then ground in a coffee-mill, and a teaspoonful of the flour is put in a tumbler of warm water at a temperature not above 130° F. (so as not to destroy its diastasic effect), and after standing for a quarter of an hour, it is added to the pint of sweetened rice-decoction, which soon becomes semi-liquid, and after twenty minutes is strained and then used for feeding.

Buttermilk is very variable in its effects, as Delmas points out, but Dunn[6] reports good results from its use where the diarrhœa is what he describes as "fermental": a disorder not associated with any persistent fever, nor with blood in the stools, but of sudden onset, showing loose, watery, foul or sour stools, and generally some vomiting. Buttermilk has usually been carefully sterilized or pasteurized before use for infants, but Dunn, after pasteurizing it to kill all other organisms, inoculated it with lactic acid bacilli and gave it without further pasteurization. In twenty-three out of thirty-five cases of infantile diarrhœa it produced some improvement, as shown by improvement in the character of the stools, and a gain of weight in the infant. He thinks this preparation is useless in diarrhœa of dysenteric origin, and in cases of simple, acute, intestinal indigestion.

Where buttermilk was not tolerated, Dunn gave living bouillon cultures of **Lactic Acid Bacilli.** If an ordinary milk mixture can be tolerated when "ripened," that is "soured" by the addition of lactic acid bacilli, this is to be used in preference to buttermilk. It is generally advisable to skim off the cream as completely as possible before inoculating the milk with the culture, as infants tolerate this soured milk better when its fat percentage is low.

Ewart and Guest[7] report cases of gastro-enteritis in which improvement occurred on the so-called "**Yacca Milk,**" which was sometimes used diluted like ordinary milk, and sometimes not diluted at all.

REFERENCES.—[1]*Proc. Roy. Soc. Med.* Mar. 1909 ; [2]*Jour. of Hyg.* Sept. 1909 ; [3]*Med. Press*, June 23, 1909 ; [4]*La Clin. Infant.* Nov. 1907 ; [5]*Jour. Child. Dis.* Nov. 1908 ; [6]*Jour. Amer. Med. Assoc.* Aug. 1909 ; [7]*Med. Press*, July 7, 1909.

DIARRHŒA, PUERPERAL, OF BENGAL. (*See* SUTIKA.)

DIETETICS. *Robt. Hutchison, M.D.*

Purin-free Diet.—Bryce[1] is of opinion that although the purin-free diet is an admirable method of treatment in chronic disease, it is not suited for regular use in ordinary life. He has found great benefit from it in cases of headache, epilepsy, and asthma, but the results were usually only temporary, and when malnutrition arose the trouble returned. After that, however, a diet containing the old forms of proteid but with a minimum of purins, kept the patients in comparatively good health. He is in the habit, in all chronic cases of disease in which the ordinary methods of treatment have yielded no good result, of cutting off all xanthin-containing and purin-containing articles of diet which are at the same time non-nutritious, and this includes tea, coffee, cocoa, meat soups, beef teas, and gravies. The first three contain methyl-purins, which, although they add no uric acid to the excretions, increase very largely the total urinary purin content. Nothing is lost by this means, because it has been proved that purins yield no potential energy and exert no influence on the circulation or nervous system, although they may temporarily remove feelings of fatigue, and because of their peptogenic effect slightly aid digestion. But they undoubtedly throw a great deal of extra work upon the organs of excretion and thus cause a loss of energy, and by increasing the complexity of the digestive processes, are liable to form toxins. He is strongly of opinion that when all these food accessories have been expunged, or nearly so, from the diet list, very little harm can result from the other purin-containing elements ; and as these are chiefly proteids to which our digestion and tissues are accustomed, their deprivation is not lightly to be recommended. The conclusion of the whole matter would appear to be that the man who lives on simple diet in a moderate way is perfectly well able to deal with all the purins with which he is likely to meet.

In addition to lessened intake of purins he thinks the following factors play a part in the good results obtained from the above diet : (1) Diminished amount of food ; (2) Diminished amount of proteid ; (3) Greater attention to mastication and other laws of health previously ignored. Personal idiosyncrasy, also, has doubtless much to do with the matter.

In designing a purin-free diet the following foods are at our disposal :[2] Milk—fresh, soured, buttermilk, or whey ; eggs—boiled, poached, scrambled, or raw ; white (not brown) bread and butter ; macaroni and cheese, rice, tapioca, semolina, and vermicelli. Suet may be used

for puddings of all kinds, such as currant or jam roll, treacle, apple dumpling, etc. Pastries, pancakes, jellies, and the usual tea-cakes are also available. All vegetables, except the pulses (peas, beans, and lentils) are poor in purin. Practically all fruits may be permitted. As to drinks, tea, coffee, or cocoa are excluded, and hot water, claret, or burgundy, mineral waters, or hot milk may be substituted. Beer and porter should be discontinued, and alcohol diminished as far as the usual habits make possible. Condiments are generally craved for, and there is nothing to be gained by withholding them unless they are otherwise contraindicated.

Dry Diet.—Haig[3] discusses the question, How much fluid does the body require? He is of opinion that the 50 oz. ordinarily taken is unnecessarily high, and that the body can easily accustom itself to an intake of 30 oz. He has found great benefit from such a reduction of fluid in cases of heart disease and aneurysm. Under it the blood-pressure falls 20 or 30 mm. and the heart recovers tone. He has never seen urinary gravel induced by reduction of fluid in those who have not previously had it.

Salt-free Diet.—Mendel,[4] from a study of the metabolic relations of common salt in human physiology, concludes that the consumption of even a normal amount increases the amount of body-fluids by 1½ to 3 litres, and even if the kidneys are healthy, the consumption of a greater quantity can lead to an increased water-retention. A diminished intake leads to a gradual excretion of the retained salt, along with the water which holds it in solution. So long as the heart and kidneys are healthy the increased amount of fluid in the body is of no importance, but it results in an increased exudation so soon as the normal function of the vessels is impaired: in parenchymatous nephritis it induces œdema, and in heart disease it increases the resistance in the circulation and leads to failure of compensation. All these results can be prevented by diminishing salt intake. In acute disease this is best achieved by a purely milk diet, but in chronic cases it is necessary to adopt a mixed diet containing a minimum of salt.

Exclusive Proteid Diet.—Young[5] directs attention to the value of this diet in chronic digestive disorders which have resisted other methods of treatment. The basis of the diet consists of thoroughly cooked minced lean beef (so prepared that all gristle and the greater part of the connective tissue are removed) and hot water. (Minced mutton or chicken may be substituted occasionally for variety, but bulk for bulk neither is so nourishing as the beef). The minced beef is given three times a day, with a five-hour interval between each meal. The best hours are 8.30 a.m., 1.30 p.m., and 6.30 p.m. In any case the last meal should not be later than 7 p.m. The hot water is given four times a day, one and a half to one and a quarter hours before each meal, and three and a half hours after the last meal. The water should be *sipped slowly* at a temperature of about 120° F.—roughly that at which tea or coffee is usually taken. The quality of the water is an important factor, and if at all hard, distilled water must be used. The

quantity of meat at each meal varies from 2 oz. upwards, the quantity of each portion of hot water being a pint, or less, according to the nature of the case. As the patient improves, a little supercooked starch food may be added, such as baked bread (thin slices of bread baked in the oven until golden brown), breakfast biscuits, rusks or zweiback, with which a little butter is sometimes allowable. Small portions of fish, chicken, fresh game, lamb, and mutton (not necessarily minced) may also be gradually introduced. Later, boiled rice, milk puddings, purées of vegetables, and fruits may be added to the dietary (all such conditions, however, being justified by periodical clinical analyses), and so the patient gradually returns to a normal mixed diet. The author enters into numerous details regarding the technique of preparing the diet and other points.

References.—[1]*Brit. Med. Jour.* Oct. 31, 1908; [2]*Ibid.* Jan. 9, 1909; *Ibid.* Apr. 24, 1909; [4]*Münch. med. Woch.* Nos. 9 and 10, 1909; [5]*Clin. Jour.* Nov. 4, 1908.

DIPHTHERIA. *E. W. Goodall, M.D.*

Etiology.—The influence of contacts in the dissemination of this disease and the value of isolating such individuals until the cultures are negative are discussed by Jessie W. Fisher[1] in an account of an epidemic which ran on in the Connecticut Hospital for the Insane from April, 1907, to May, 1908. Altogether there were 92 cases. Her conclusions are: (1) The chief sources of infection in this epidemic were latent cases (bacillus carriers), rats, and cats. (2) One negative throat culture is insufficient for diagnosis. (3) Two or even three successive negative throat and nose cultures do not constitute sufficiently strict quarantine regulations to prevent the spread of diphtheria. (4) In institutions in which large numbers are congregated, at least four successive negative cultures, including at least two nose cultures, are imperative. (5) All healthy individuals carrying bacilli in their throats should be isolated during a time of epidemic in institutions, unless wholesale immunization can be undertaken. (6) The isolation of bacillus carriers in private practice is neither reasonable nor expedient. (7) Bacillus carriers harboured the bacilli longer than did the clinical cases of diphtheria. [With regard to conclusion 1, the statement that rats and cats acted as carriers is hardly justified by the facts as reported by the author. Cultures were made from the fauces, paws, and fur of 10 rats killed on different occasions at the mouth of the sewer which received the waste from the isolation hospital; and 10 cultures were taken from the sewage itself. The author states that some of the cultures resulted in growths of an organism indistinguishable morphologically from the diphtheria bacillus; but no experiments appear to have been made to ascertain the nature or the virulence of these organisms upon guinea-pigs. Only one cat appears to have been examined.—E. W. G.].

Myer Solis Cohen,[2] of Philadelphia, gives a detailed account of several outbreaks of diphtheria in institutions and private houses,

in order to emphasize the necessity of examining bacteriologically all those inmates who are brought into contact with the patient, and of isolating those who are found to be harbouring the diphtheria bacillus on their mucous membranes (fauces and nose usually). His procedure is much like that which was carried out some years ago in this country at Colchester and Cambridge. He recommends that in the case of contacts in which bacilli morphologically resembling the diphtheria bacilli are found, inoculation tests on guinea-pigs should be performed, and if the bacilli are virulent, the contact should be isolated, but not otherwise.

The question of the dissemination of the disease by latent and ill-defined cases, and by contacts, was also discussed at length at the Belfast meeting of the British Medical Association in 1909.[3]

Pathology.—A new method of staining diphtheria bacilli is described by W. H. Rush, of St. Louis, Mo., U.S.A.[4] The following are the materials required: Grübler's methylene blue; Grübler's eosin, "W.G.," or "rein"; tartaric acid; alcohol, 96 per cent; and distilled water. The solution should be prepared as follows: (*a*) Saturated aqueous solution of methylene blue, filtered, 10 cc.; tartaric acid, 10 per cent aqueous solution, 10 cc.; distilled water, 80 cc. (*b*) Tartaric acid, 10 per cent aqueous solution, 10 cc.; alcohol, 96 per cent, 50 cc.; distilled water, 40 cc. (*c*) Eosin, saturated aqueous solution, filtered, 1 cc.; distilled water, 199 cc. Stain thin films—on a cover-glass or slide, fixed by a flame in the usual way—ten seconds in (*a*); wash ten seconds in (*b*); stain ten seconds in (*c*); blot and dry. Drying or washing between the different steps in water is unnecessary. The polar bodies will be stained deep violet blue; the remainder of the bacillus is of an intense pink colour, as are most other organisms that may be present.

Howard T. Karsner,[5] of Philadelphia, undertook a series of observations in thirteen cases of diphtheria in order to ascertain whether or not treatment by antitoxic serum had any effect on the number of leucocytes in the blood. In diphtheria there is a moderate increase in the number of leucocytes, but the increase is by no means in proportion to the severity of the case. The administration of antitoxin has no appreciable effects on the degree of leucocytosis. Karsner says that his observations do not confirm Engel's statement that myelocytes are present in the blood in diphtheria, especially in severe cases.

Treatment.—In a paper on the cardiac disturbances in diphtheria, John Howland[6] discusses their causes and treatment. The two chief lesions are parenchymatous and interstitial. The former are of a degenerative nature, and are either fatty, or consist of changes which lead to the formation of granular detritus and hyaline masses. According to Howland, the latter form of degeneration is rarely found earlier than the seventh day. Fatty degeneration occurs earlier. "The interstitial changes are of two types. In the one there are focal collections of lymphoid and plasma cells. In the other

there is an invasion of the degenerated and necrotic muscle cells with endothelial cells and polymorphonuclear leucocytes." These interstitial changes occur late in the disease, when the patient appears to be convalescing.

So far as the circulation is concerned, the chief symptoms produced by the early lesions just mentioned are progressive feebleness of the heart's action, ending in collapse, with a rapid lowering of blood-pressure. Treatment is most disappointing. Howland advises **Caffeine, Camphor,** and **Digitalin** subcutaneously, and also **Adrenalin**; but he does not lead his readers to expect much from drugs, nor indeed from any treatment, though rest is absolutely essential. The symptoms of the later forms of degeneration first appear between the ninth and fifteenth day; the pulse-rate falls and the heart's action becomes irregular in rhythm and, what is of more importance, in force. While the rate is usually low, it not infrequently becomes moderately but persistently high. Often it varies in frequency from time to time. Auscultation will reveal an alteration in the character of the first sound of the heart, which becomes short and weak, and resembles the second sound. A systolic murmur is often present. This alteration of the first sound is due, according to the writer, to the changes in the muscle fibres. If Gräupner's test is applied, it will be found that the blood-pressure, instead of rising with the pulse-rate, will fall. Gräupner's test is the "testing of the pulse-rate and blood-pressure before and after a certain amount of physical exercise. The normal or compensated heart reacts to this by a rapid rise in pulse-rate, which in the course of a very few minutes returns again to normal, and by a gradual rise in blood-pressure, which persists for a considerable length of time after the rate is normal. Insufficient hearts react in various ways." In cases of heart-irregularity following diphtheria, this test must be applied with great caution, and but a small amount of physical exercise employed. The most important point in treatment is the enforcement of complete **Rest.** Drugs are of little avail.

It has been believed by many authorities that some, at any rate, if not all, of the late circulatory disturbances are due to degenerative changes in the vagi. But Howland does not share this opinion. The vagi are often found to be degenerated in cases of diphtheria fatal at a late stage (Thomas, Hibbard, Steensland, Mallory); but circulatory troubles are by no means always present even in these cases. Rather are the symptoms to be ascribed to changes in the heart muscle and to metabolic alterations produced by the toxin of diphtheria. In one case Howland found that during early convalescence the nitrogen excreted was greatly in excess of that ingested, at any rate for a short time. Further investigation is required on this point.

The use of **Pyocyanase** in the treatment of diphtheria has recently been advocated by Karl Zucker, of Gratz, and by Julius Grosz[7] and Helene Báu,[8] of Budapest. Pyocyanase is an enzyme obtained from the *Bacillus pyocyaneus* by filtering a fluid culture of the bacillus of some weeks' growth through a Berkefeld filter and concentrating it

to one-tenth of its volume in a vacuum apparatus. The solution is then dialysed in order to remove salts and certain toxic substances. Therapeutically, pyocyanase is used in a watery solution by swabbing or spraying, two to fourteen times a day, or more often. Pyocyanase is powerfully bacteriolytic, and Zucker explains its favourable action by supposing that it destroys or hinders the growth of the diphtheria bacillus and other organisms. Antitoxic serum should also be employed subcutaneously.

Of recent years certain Continental writers have advocated the use of **Antidiphtheritic Serum** (antitoxin) in cases of the *paralysis* which so commonly follows diphtheria, and especially in severe cases of paralysis (Comby, Sicard, Kohts, Descos and Vial).[9] Comby goes so far as to say that every patient attacked by post-diphtheritic paralysis, whatever its form or localization, should be treated with antitoxin, of which the doses should be large and repeated. It is difficult, however, to be sure that in the cases which have been reported as cures of paralysis by antitoxin, the patient would not have recovered equally quickly and completely without antitoxin. As a matter of fact, most of the cases of paralysis recover with rest and proper feeding ; and recovery from severe generalized palsy is by no means so rare as the writers quoted above would have us believe. The paralysis is due to a definite nerve lesion, which must be repaired before the functions of the nerves can be brought into use again. It is conceivable that this repair is aided in certain cases by the subcutaneous injection of serum, which acts in these cases as a food, and not as an antibody. But in that case the serum need not be an antitoxic one ; any sterilized horse serum would suffice. The cases referred to are those in which there is repeated vomiting or in which food given by the mouth or rectum is not properly digested and assimilated. The writer of this note prefers, however, not to treat cases of post-diphtheritic paralysis with serum, on account of the unpleasant effects which are occasionally set up in the way of pyrexia and rashes.

In an article on *tracheotomy*, F. M. Turner[10] advocates what he terms the short operation. The two chief points in this are, the shortness of the skin incision, and the opening of the trachea with the aid of the sense of touch alone. The advantages he claims are quickness, smallness of scar, less necessity for using chloroform, and the absence of necessity for introducing any instrument but the knife into the wound until completion (e.g., retractors or hooks). Against the contention that when the trachea is seen before it is opened, the operation, though slower, is surer and safer for the novice, he urges that his own experience of operating by sight, which he formerly practised and also assisted at, is that slowness and caution do not give any added freedom from risks, as difficulties are apt to crop up in proportion to the time occupied. But he rather discounts this statement when, later in his article, he discusses the difficulties of the operation ; for these appear to be exactly the same as those encountered by the performance of the so-called longer operation. Turner advocates

the short method, not only for the expert, but also for the novice in hospital and for the general practitioner, "who is forced to operate, perhaps, for the first time in his life under unfavourable conditions." He adds, however, that the general practitioner should undertake the short operation "only on condition that it did not destroy his self-confidence." Considering that in the case of most men confidence comes with experience, this proviso is tantamount to a recommendation in favour of the long operation for the general practitioner and novice, a recommendation with which the writer of this note agrees. Turner and his staff are by no means the only operators who make use of the "short" operation. Every surgeon who is called upon frequently to perform tracheotomy, comes after a time to use his touch more than his sight, to make his skin incision small, and to accomplish the operation in a few seconds. But the novice is strongly recommended to see the trachea before he opens it and to make his skin incision longer than the half inch advised by Turner.

There are three points connected with the operation which Dr. Turner does not mention. He draws attention to the fact that sometimes the operator will fail to find the trachea, and believes that this difficulty occurs more often in the "long" operation. But he does not point out how this can be avoided. Now if the operator, before he makes his skin incision, places his left thumb on one side of the trachea and his left second finger on the other, and presses thumb and finger backwards towards the spine, and keeps the finger and thumb in these positions until the trachea is opened, the trachea cannot slip to one side, and the operator knows where it is. The left forefinger, it may be observed, is free to act as a feeler as the operation proceeds. The second point is, that novices are very prone to make the incisions shorter, the deeper they go, so that by the time the trachea is reached, only a very small portion of that structure is exposed at the bottom of a funnel-shaped wound, and there is a difficulty in making a proper incision into it. All the incisions down to the trachea should be of the same length, or nearly of the same length, as the skin incision. Thirdly, the incision into the trachea may be too small, and the operator fails to get the tube in, but may instead push it in front of the trachea, between the trachea and the fascia. The operator should make certain, before he attempts to insert the tube, that the opening in the trachea is sufficiently large.

In one matter the writer agrees with Dr. Turner, namely, that it is quite unnecessary for the operator to think, when he is commencing the operation, whether he will do a high or a low operation. The ordinary surgical text-books make too much of this. As often as not, the operator will not see the thyroid isthmus at all, but if he does he can then decide whether he will open the trachea above or below it, or whether he will divide it and then open the trachea. In most instances it will be found easier and quicker to enter the trachea below the isthmus. Moreover, by performing the low operation, the operator avoids the risks of cutting the cartilages

of the larynx, a proceeding which, according to Lambert Lack,[11] is extremely likely to lead to cicatricial stenosis of the larynx. Lack states that he has never seen laryngeal stenosis follow diphtheria in which a genuine tracheotomy, as distinct from an operation in which the larynx has been opened, has been done.

In a note following a short account of three cases of primary tracheotomy for diphtheria, in which the patients (children) were unable to dispense with the tube for periods varying from seven to eight months after the operation, Duncan Forbes and R. M. Courtauld[12] state that cases such as those they narrate indicate : (1) That considerable patience must be exercised in the treatment ; (2) That if the patient remains in hospital there is every hope of his final recovery ; (3) That it is doubtful if active interference has any beneficial result ; (4) That the amount of obstruction varies from time to time, and that the removal of the tube should be undertaken when this is at a minimum ; (5) That only occasional attempts to find out the degree of obstruction should be made (not more than once in three weeks or a month in prolonged cases) ; (6) That the principle of early removal of the tube is right (an attempt to remove finally should be made some forty-eight to seventy-two hours after the operation) ; (7) That the use of feathers should be avoided ; (8) That no advantage seems to be gained by the replacement of the metal by a rubber tube ; and (9) That fenestration of the tube allowing of the passage of air through the larynx is not found to lead to improvement. [I think that some of these conclusions are hardly to be justified from so small a number of cases. For instance, conclusion (3) concerning active interference ; this depends what is meant by active interference. In one of the cases related, it is stated that eighteen months after the operation the patient, a boy aged 4 at the time of the first operation, had his tonsils and adenoids removed, and that these operations were followed by a gradual recovery. From one or two cases I have seen, I should be inclined to say that if these operations had been performed earlier, the tracheotomy tube would have been got rid of sooner. The authors, moreover, do not appear to have tried intubation as a means of enabling the patient to do without the tracheotomy tube. This measure is certainly of value. With respect to conclusion (7), I very much doubt whether feathers or forceps have much to do with the retention of the tube. Certainly this may take place without their use. But I agree that feathers are of little, if any, use in extracting membrane from the trachea. Forceps, however, are in some cases necessary, and, if properly used, will cause no harm. I am not disposed to admit that the use of fenestrated tubes is of no value ; but I agree with the author's conclusions regarding indiarubber tubes.—E. W. G.]

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* Feb. 6, 1909 ; [2]*Ibid.* Jan. 9, 1909 ; [3]*Brit. Med. Jour.* Aug. 28, 1909 ; [4]*Amer. Jour. Med. Sci.* Dec. 1908 ; [5]*Univ. Pennsylv. Med. Bull.* Sept. 1908 ; [6]*Jour. Amer. Med. Assoc.* Dec. 19, 1908 ; [7]*Berl. Klin.* Jan. 1909, quoted in *Lancet*, Feb. 20, 1909 ; [8]*Münch. med. Woch.* Jan. 26, 1909, quoted *Ibid.* ; [9]Quoted in *Pract.* Dec. 1908 ; [10]*Pract.* Jan. 1909 ; [11]*Brit. Med. Jour.* Oct. 16, 1909 ; [12]*Lancet*, Aug. 29, 1909.

DISLOCATIONS. *Priestley Leech, M.D., F.R.C.S.*

Metatarsus.—Quénu and Küss[1] present a detailed study on luxations of the metatarsus and of the diastases between the first and second metatarsal bones. Their conclusions are: (1) Every dislocation of the metatarsus the diagnosis of which has been confirmed and rendered accurate by radiography ought to be immediately reduced. (2) In every recent irreducible luxation the surgeon should attempt to remove the obstacle to reduction by an open arthrotomy. (3) If after arthrotomy reposition of the tarsus is not obtained, partial resections, etc., should be performed; the cuneiform bone should not be removed unless its preservation is seen to be impossible. (4) In old dislocations

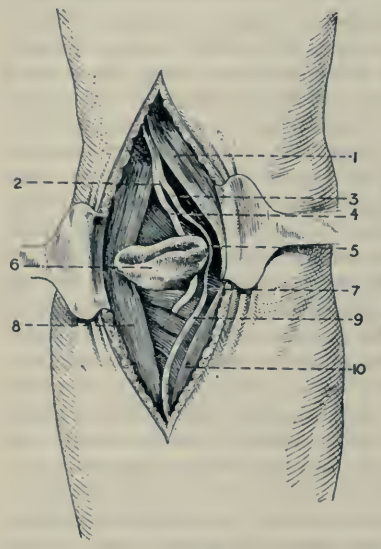

Fig. 25.

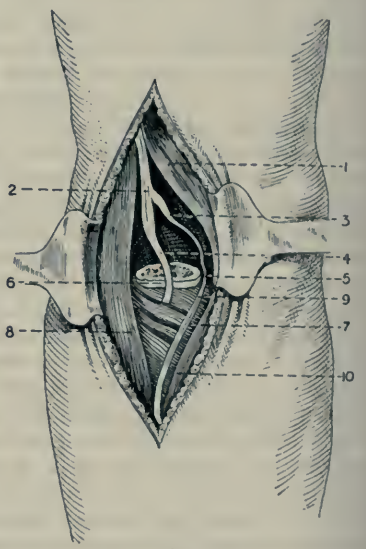

Fig. 26.

Fig. 25, 26.—Injury of the musculospiral nerve in fracture of the head of the radius. 1, biceps; 2, point of division of musculospiral nerve; 3, proximal end of radial nerve; 4, posterior interosseous nerve; 5, fibrous strand connecting ends of radial nerve; 6, dislocated head of radius, and neck of same after resection of head; 7, supinator brevis; 8, supinator longus; 9, distal end of radial nerve; 10, pronator radii teres.

operative indications are less precise, and depend on the amount of interference with the function of the foot. The age of the lesions and the deformation of the bones may render a complex intervention necessary.

Head of the Radius and Musculospiral Paralysis.—De Witt Stetten[2] describes an injury to the musculospiral nerve which hitherto has been generally overlooked or has not been published. His notice was drawn to this injury by seeing a patient, a male aged nineteen, with fracture of the ulna and forward dislocation of the right arm and paralysis of the musculospiral nerve. Examination of the paralysis of the nerve showed that the injury was probably below the bifurcation

into the posterior interosseous and radial, as the extensor carpi radialis and the supinator longus were not paralyzed. Bloodless reduction was found to be impossible, and an operation was performed, when it was seen that the head of the radius was pushed between the two branches of the musculospiral nerve as shown in the figure; the head of the radius was removed, the limb placed in plaster, and recovery ensued. Experiments on the cadaver show that in dislocation of the head of the radius the two divisions of the musculospiral nerve are endangered. This is most likely to occur when the dislocation accompanies ulnar fracture and when the direction of the dislocation is forwards and slightly outwards. The nerve is almost invariably injured below its point of division into the posterior interosseous and radial. One or both branches may be caught by the dislocated head. The symptoms are practically those of typical musculospiral palsy. They may vary greatly in extent or degree, depending on whether one or both branches be injured, and how badly. The supinator longus muscle escapes involvement. The prognosis is good under appropriate treatment: simple reduction if possible, and generally resection of the head of the radius in old cases, with nerve suture if necessary. Stetten has found, since the publication of his paper, that Sherren notes the occurrence of two cases.

Osseous Growths at Elbow following Backward Dislocation of the Elbow.—Greig[3] draws attention to a condition which may occur after backward dislocation of the elbow, and be a source of anxiety, if not of charges of malpraxis against the surgeon. There is an ordinary backward dislocation of the elbow, which is reduced and gives a good functional result, but in a short time the movements at the joint become much limited, and a growth of new bone is discovered which springs from that part of the ulna below the coronoid process that is covered by the insertion of the brachialis anticus. Greig quotes notes on three cases, in one of which he removed the new bone with great improvement in the joint movements. A surgeon who is not acquainted with this condition, and who may first see the case some time after the injury, may easily imagine that it was not a simple dislocation but a dislocation complicated with fracture. Mr. Jones and Dr. Morgan, of Liverpool, have published a monograph on this subject entitled, "On osseous formation in and about muscles, due to injury." They describe 17 cases, and it is significant that 15 of these refer to dislocations at the elbow, and the other 2 are not in connection with joints at all, but growths of bone following traumatism at some distance from joints. They have collected besides from various sources 89 cases of "osseous formation" following injury: 68 in the upper limb and 21 in the lower. Of the 68, 16 are so briefly or imperfectly reported that they are valueless for comparison, but of the remaining 52 no less than 37 resulted at the elbow joint after a dislocation or severe sprain. Jones and Morgan attribute the change to a traumatic myositis ossificans, but Greig thinks the new bony formation is callus, produced by a tearing away of muscle and peri-

osteum from the bone, and escape from the Haversian canals or from the periosteum, of the elements which are necessary to the production of callus.

Recurrent Anterior Dislocation of the Shoulder.—In a long article on this subject, Turner Thomas[4] thinks that the essential lesion in recurrent dislocation of the shoulder is the tear in the capsule which permitted the first escape of the head of the humerus from the glenoid cavity, and the other lesions which have been described are of secondary importance. In order to investigate this subject, he produced anterior humeral dislocations on the cadaver, and in five cases which he examined there was no tear in the capsule except the usual anterior one, which in all of these occurred from the anterior and lower glenoid margin, and extended from the origin of the long head of the biceps above, to, or beyond that of the long head of the triceps below. The only exception was one on which he operated, where the tear of the capsule occurred, not at the glenoid margin, but about half an inch below and parallel to it; it extended from the level of the long head of the biceps above to at least that of the long head of the triceps below. The new space formed by the dislocated head tends to become permanent, and then becomes lined by a smooth surface; this results probably from an extension of the normal endothelium from the margins of the original tear, and is reinforced externally by connective tissue, probably from a combination of the surrounding fascia and cicatricial tissue. The enlargement of the capsule noted in practically all the cases is due to the cicatricial new portion added to the old capsule, and is not the result of reluxation of the capsule as has been suggested so often. Bardenheuer and others accounted for it by assuming a distention of the joint from the accompanying inflammatory hydrops. Defects in the head of the humerus have also been credited with the causation of recurrent dislocations; they are usually unimportant and do not require resection. Thomas also considers the evidence of tearing away of the infraspinatus and supraspinatus muscles with the underlying capsule from the humerus, suggested by Joessel as a cause of recurrent dislocations, as unconvincing and based on a misinterpretation of the specimens. His conclusion is that the usual anterior habitual or recurrent dislocation of the shoulder is due to a traumatic, cicatricial, anterior hernial pouch of the capsule, and that the object of any operation should be to obliterate the hernial protrusion. It would be an easy matter to remove at the same time any free or attached joint body that might be present.

Treatment.—Beyond the wearing of an apparatus, usually made of leather, the only means of preventing recurrences is an operation. The operation to be performed is capsulorrhaphy. Various incisions have been employed to get access to the joint. Thomas recommends an incision in the axilla; the head of the humerus is more superficial in the axilla than on any other side, and with abduction of the arm it is brought still nearer to the surface. In his case the only muscle that needed division was the subscapularis. Excellent results have been

obtained by reefing the capsule without opening it; exploration of the joint is advisable to detect and remove any movable joint body, and to repair any other lesion that may be present. As far as Thomas could gather there had been no death after the operation, and only two recurrences; the movement of the joint has been good. The usual incision has been one dividing the deltoid muscle or one separating it from the pectoralis major. (For "after-results," *see* JOINTS.)

REFERENCE.—[1]*Rev. de Chir.* Jan. Feb. Apr. June, and July, 1909; [2]*Ann. Surg.* Aug. 1908; [3]*Edin. Med. Jour.* Oct. 1908; [4]*Amer. Jour. Med. Sci.* Feb. 2, 1909.

DYSENTERY. *J. W. W. Stephens, M.D.*

R. P. Strong[1] gives the results of systematic research into the subject of dysentery, and shows how important a knowledge based on accurate research is in combating disease. Thus dysentery in the Philippines is due to at least three different causes: (1) Amœbic dysentery due to amœbæ identical with the form prevalent in Africa; (2) Bacillary dysentery due to *B. dysenteriæ*, the form prevailing in Japan; (3) Catarrhal dysentery prevalent more or less throughout the world. As regards the prophylaxis, it has been shown that amœbæ exist in the water supply of Manila, and hence, although it has not been actually proved that they are the cause of amœbic dysentery, the people are educated to drink only **Boiled Water** or imported **Aerated Water.** The bacillary form is also contracted in this way, and in some cases at least, the catarrhal form only, so that the prophylaxis is also the same. The diagnosis of each form can readily be made: in the amœbic form by examination of the stools; in the bacillary by the agglutination reaction, this reaction being negative in the two other forms. The treatment is quite different also in the different forms. The best mode of treating the amœbic form is by local applications (enemata). This is absolutely useless for the bacillary form, for which **Antidysenteric Serum** is best. Lastly, the catarrhal form generally yields to simple remedies.

M. B. Saunders,[2] while admitting that some practitioners have found it valueless, advocates the use of a new drug in the treatment of *amœbic* dysentery. This is **Chaparro Amargoso,** *Castela Nicholsoni*, Hook: synonyms, amargoso, chaparro bush, goat bush. It contains a resin, amargosin. The drug is administered in the form of a fluid extract in drachm doses every three or four hours, or as an infusion of the bark and stems. M. Ambrose[3] likewise advocates a new drug, viz., the rind of the fruit of the **Mangosteen,** *Garcinia mangostane* (Nat. order, Guttiferæ). The rind is terra-cotta coloured, and is $\frac{1}{4}$ in. thick. This is roasted and powdered. The dose recommended is up to a drachm every second hour in acute cases, and a half drachm thrice a day in chronic cases. He records acute cases recovered in four days.

Bacillary Dysentery.—K. Shiga[4] emphasizes the great importance of using in the treatment of bacillary dysentery a **Polyvalent Serum,** i.e., one made from the four main types of dysentery bacillus.

Amœbic Dysentery.—C. M. Wenyon,[5] in a paper on intestinal amœbiasis, draws attention to the view that the finding of protozoa in the stools in diarrhœic conditions is no evidence that they are the cause of the diarrhœa, basing this view on the fact that various protozoa, e.g., *Amœba sp.*, exist in healthy animals. With regard to the amœba in the gut of man, he notes that the life cycle is the only definite means of distinguishing the different amœbæ. He has been able to confirm Schaudinn's views with regard to the non-pathogenic *Entamœba coli* by a study of the *same* amœba in mice. It divides in the cæcum or colon into two or eight. Cyst formation takes place, and eight nuclei are formed in the protoplasm, which then divides into eight daughter amœbæ. These are liberated when the cyst is taken into a new host. With regard to Schaudinn's *Entamœba histolytica* he is not able to confirm his views, possibly for the reason, as he states, that he may not have seen it. This amœba is stated by Schaudinn to develop quite differently, viz., by budding off minute parts of the protoplasm, which then becomes encysted.

A. R. S. Anderson[6] found in Port Blair, Andaman Islands, that more than 50 per cent of his cases of dysentery had amœbæ in the stools. Of patients not suffering from dysentery, about 30 per cent had amœbæ in the stools. The amœbæ in these latter cases could not be distinguished from those in the dysentery cases, which the author says were undoubtedly *E. histolytica*. He concludes, therefore, that this amœba is a harmless commensal. Again, although more than 50 per cent of the dysentery cases have amœbæ (*E. histolytica*) in their stools, less than 1 per 1000 developed abscess of the liver; hence it is argued that amœbæ (*E. histolytica*) are not the cause of liver abscess. That amœbæ are found in liver abscesses the author attempts to discount by his having found *Trichomonas* (*? Cercomonas*) *hominis* in liver abscesses, and in fact he discovered this parasite more often than amœbæ in the intestine in dysentery cases. G. S. Hanes[7] advocates a new mode of treatment.

Diagnosis.—The author does not consider examination of the fæces sufficient, but uses the proctoscope, the patient being in an inverted position. If the mucous membrane is soiled by discharge, two or three glasses full of water are poured in through the proctoscope, and the patient is allowed to pass them at once. The ulcers are then thoroughly scraped with a sharp curette, and the scrapings examined microscopically.

Treatment.—*Diet*: Except in the acute stages the diet should not be restricted, but consist of rich, nourishing foods, excluding vegetables, fruits, and sweets. *Rectal Injections*: After careful trials, the author has now no hesitation in injecting a quart or more of undiluted refined **Petroleum** (coal-oil). The patient is placed in the inverted position, the proctoscope is introduced, the bowel is then cleansed with normal saline solution, and the patient is allowed half an hour to one hour and a half for the return of the solution. He is then again inverted, and by means of the proctoscope one glassful to a quart of coal-oil

is introduced. The patient is then asked to keep in the recumbent position for half an hour or longer. By the use of the inverted position, oil solutions will penetrate even beyond the cæcum. In some cases it may be necessary to introduce the oil through the appendix after appendicostomy.

Dock[8] draws attention to the value of **Ipecacuanha** in the treatment of amœbic dysentery, in spite of the conflicting statements of various authors. He has obtained remarkably good results in the treatment of chronic amœbic dysentery. The patient should be kept in bed. The gut should first be cleansed by Epsom salts with or without a preliminary dose of calomel. All food is stopped while the ipecacuanha is given, and only liquids such as albumen-water, gruel, whey, weak tea, and water given after it. The ipecacuanha is given in pills covered with salol or keratin. In this way the emetic action is avoided, and the use of opium becomes unnecessary. From 30 to 60 gr. may be given at first, and then 20 to 40 gr. twice a day for three days. When given in this way vomiting is rare. The patient should lie down after taking the drug, with an ice-bag to the epigastrium or throat in case of nausea. Griping after the drug may be treated by a hypodermic injection of atropine. After the amœbæ have disappeared, **Hot Normal Saline** or **Ice-Water Irrigations** of the colon are valuable. Ulcers of the rectum, if found by a proctoscopic examination, should be treated locally, e.g., touched with nitrate of silver. The first sign of improvement was a marked diminution of the hepatic pain, then a fall of temperature, and lastly diminution in the size of the liver. The author states that amœbic abscess of the liver is a preventable disease in patients coming early under skilled treatment. Further, he recommends the treatment by ipecacuanha after operation for liver abscess to prevent recurrences.

Mode of Treatment.—The ipecacuanha should be continued in full doses of 20 to 30 gr. once a day for one to two weeks after the temperature has fallen in these cases of pre-suppurative hepatitis. The drug is given coated with melted salol or keratin; the author prefers the latter method.

L. Rogers[9] gives the result of twenty-five further cases in his mode of treatment of the pre-suppurative stage of liver abscess by ipecacuanha. He draws attention to the fact that leucocytosis occurs in amœbic hepatitis long before any suppuration has taken place, and that the leucocytosis is characterized by the percentage value of only 70 to 80 per cent of polynuclears.

Hepatic Symptoms.—The liver was nearly always enlarged below the costal margin. In most cases the symptoms were acute, and in many a suspicion of suppuration was entertained.

References.—[1]*Jour. Amer. Med. Assoc.* Feb. 13, 1909; [2]*Med. Rec.* Feb. 20, 1909; [3]*Med. Press*, Jan. 29, 1909; [4]*Zeits. f. Hyg. u. Infektionskrank.* lxi. in *Sem. Méd.* July 29, 1909; [5]*Brit. Med. Jour.* Oct. 24, 1908; [6]*Ibid.*; [7]*Jour. Amer. Med. Assoc.* June 19, 1909; [8]*N.Y. Med. Jour.* July 10, 1909; [9]*Ther. Gaz.* June 15, 1909.

DYSMENORRHŒA. *Victor Bonney, M.S., M.D., F.R.C.S.*

Herman[1] has published a paper written in his interesting style on this subject. Mature experience and reflection have led him to believe with Matthews-Duncan that there is only one form of genuine dysmenorrhœa. It is a disease, not a symptom depending upon variable causes such as retroversion, salpingo-oöphoritis, etc., and the term should be reserved to denote morbidly painful uterine contractions. He does not believe that "obstructive" dysmenorrhœa exists. It is true that some monthly pain may occur when the outflow of the menstrual discharge is completely obstructed, but not by any means invariably so. As regards "membranous" dysmenorrhœa, he is of opinion that it is not the passage of the membrane that gives pain, for many women pass shreds or even a definite cast of the uterus without any pain at all. He believes that these patients suffer pain because their nervous systems are morbidly sensitive as regards pain. True dysmenorrhœa due to painful uterine contractions lasts only a few hours, but is very severe. The pain comes in spasms, lasting about a minute or two, and is not relieved but made worse by recumbency. Its cause is absolutely unknown. After examining the theories of malformation and endometritis, he rejects both. Similar pain is sometimes met with in the case of a small uterine fibroid that the uterus is trying to force out. It is also apt to occur in persons with a highly developed nervous system, and often arises after some years of painless menstruation. Lack of sexual feeling and sterility often accompany true dysmenorrhœa, and these defects may in certain cases be cured by relieving the dysmenorrhœa.

Herman's theory of the disease is that it exists because the centre in the spinal cord or in the sympathetic system which should regulate the musculature of the genital canal is imperfectly developed. As regards treatment, the first and simplest is the administration of **Guaiacum.** He gives 10 gr. of the resin three times a day, beginning one week before the flow starts, and continued until the period for the pain is passed. This failing, the **Cervix should be dilated.** Most cases are to be cured thus. Occasionally a relapse occurs, when the dilatation should be repeated. The natural cure of the disease is pregnancy. There are a few cases in which dilatation fails, and the pain is so severe as totally to invalid the sufferer. In these **Oöphorectomy** should be advised, but only when it is quite certain that the pain and prostration spring from menstruation and from nothing else.

These views will not meet with general acceptance, and personally I am not at all in agreement with them. By repeated questioning of patients, I am assured that the pain of typical "virginal" dysmenorrhœa is not of the spasmodic "contraction" type described by Herman, but is of a continuous, heavy, "tearing" character. It begins with, or shortly before, the flow, and endures for less than twenty-four hours as a rule. Its character suggests *tension*, and I am of opinion that it is due to the stretching of the rigid uterine

tissues by the swelling caused by the menstrual turgescence. That painful contractions do sometimes occur during menstruation is probably true, but it is a much rarer occurrence if judged by the type of pain ordinarily complained of, and is, I believe, always associated with a degree of obstruction, relative or otherwise to the escape of the uterine contents. Such pains are usually followed by the passage of clots or membrane, and are accentuated markedly by the administration of ergot, whilst in acute obstruction, such as that due to operative stenosis of the cervix, they are peculiarly violent and severe. It is true that, as Herman points out, certain cases of congenital obstruction may have no pain for a long time ; but this is due to the blood being at first easily forced out of the uterus into the comparatively capacious vagina. Later, when the vagina becomes distended to near the limit of its capacity, the uterus has to make abnormally violent efforts to empty itself, and then pain of increasing severity with each succeeding period is experienced.

Whether the monthly accentuation of pain due to uterine inflammation or displacement should strictly be termed dysmenorrhœa may be a point for argument, but at all events the term is a convenient one.

Regarding treatment, dilatation of the cervix is the only likely cure in most cases. Herman's advice to remove the ovaries in certain exceptional cases where the pain is very intractable and severe does not appear to me to be good. **The body of the uterus had better be amputated.** It is an interesting fact that, although the term " ovarian dysmenorrhœa " is often applied to these cases that defy repeated dilatation, they are cured by removal of the body of the uterus. Nor am I acquainted with a single case in which monthly pain has occurred after conservative hysterectomy, no matter for what disease it was performed, although, as is well known, the conserved ovaries continue to perform their function in spite of the absence of the uterus.

Intermenstrual Pain.—Purefoy[2] discusses the cause and treatment of this interesting condition. It is met with usually in patients over 25 years of age, and most of them are sterile or have not borne children for some years. The pain usually occurs midway between two periods, and occasionally a slight discharge, either watery or slightly blood-tinged, accompanies it. The pathological condition underlying it is unknown. Disease of the tube has been suggested, but there is no good clinical evidence to support it. Purefoy apparently believes it to be due to painful ovulation in an ovary, the seat of adhesions, or peripheral sclerosis caused by inflammation in its neighbourhood. He records a number of cases, and points out that the treatment must vary with the condition of the patient, and must be directed to the removal, if possible, of any ascertained morbid condition, and to the improvement of the general health. Removal of the ovaries should only be undertaken as a last resource. He favours the use of a pill containing **Indian Hemp** in combination with **Quinine, Aspirin** and **Arsenic** may also prove of service.

In my opinion some cases of this type of pain are probably the result of an abortive intermenstrual period. As pointed out by C. Martin and Purefoy, it is often accompanied by a blood-stained discharge from the uterus. The condition is probably dependent on abnormal ovulation, but the cause of this is obscure. Two cases have, however, lately come under my notice, where the pain was shown to be due to periodic discharge from a distended Fallopian tube into the uterus. If the pain is really of such severity as to demand operative measures, I think that, in the absence of appendage disease, the body of the uterus should be removed in preference to apparently healthy ovaries.

References —[1]*Brit. Med. Jour.* Apr. 17, 1909; [2]*Med. Press*, Jan. 6, 1909.

EAR, DISEASES OF. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

Etiology.—Interesting statistics are issued from the University Clinic at Bâle on the incidence of aural disease in the course of *scarlet fever*. Out of 750 cases of scarlet fever, about 23 per cent had some affection of the ear as a result of infection, in detail as follows: (1) Tubal catarrh, 5 per cent of cases; (2) Disease of the external ear, 0·9 per cent; (3) Otitis media catarrhalis, 9·4 per cent; (4) Otitis media purulenta, 5·7 per cent; (5) Otitis media purulenta with mastoiditis, ·8 per cent; (6) Recurrence of otorrhœa, 1·0 per cent. The writer, Nager,[1] distinguishes an early "exanthematous" otitis, and a late "post-exanthematous" type occurring after the first week and secondary to the purulent rhinitis which so frequently comes on about this time. The early form is usually an acute catarrhal inflammation, and recovers without perforation of the membrane. The prognosis is good, and deafness rarely results. The late form is an acute suppurative inflammation, very destructive, and liable to become chronic. Of the cases of mastoiditis the results of early operation were good, but healing was somewhat protracted. Out of the 750 cases, not one became absolutely deaf. Adenoid vegetations constitute the strongest predisposing factor to otitis during an attack of scarlet fever.

Nothing can be done to prevent the onset of the "exanthematous," but, by attention to the nose and nasopharynx, the otitis of the second type may be warded off in a large number of cases, and the following routine was followed with this object in view: a few drops of **Adrenalin** were instilled into the nose, followed in a few minutes by a spray of weak **Boric Lotion** or weak **Hydrogen Peroxide** solution, then a few drops of an oily solution of **Menthol, Eucalyptol,** or **Boric Ointment** finally put into each nasal passage. This toilet was repeated if necessary, two or three times a day.

From a prolonged and careful investigation of 371 *telephone girls*, Blegvad[2] reports that in 26·4 per cent of the operators with normal hearing, retraction of the membrana tympani was found in the ear most used at the telephone, and probably the abnormality was

directly or indirectly induced by the telephone. No reduction in the hearing power of telephone girls as compared with that of other people with healthy ears was observed. Reports have been published of serious damage to the ear, traumatic neuroses, etc., resulting from lightning strokes and violent electric shocks, but the writer has met with no serious cases of this kind. A number of complaints of irritation in the meatus, pain in the ear, tinnitus, pressure, fullness, and so on, were attributed to the telephone. Several complained of the pressure of the "head-telephone" on the ear, and a few suffered almost constantly from acne pustules and furunculosis in the meatus. A large number admitted that their occupation had made them "nervous" and easily tired, and some suffered from headache and auditory neuroses, such as pain, tinnitus, and hyperæsthesia acustica, due probably to the continuous strain thrown upon the attention and hearing by their calling. It is advised that only those with good hearing and normal ears should be admitted to the telephone service.

Diagnosis.—Yearsley[3] reports a case in which, following destruction of the labyrinth, there was an apparent retention of fair hearing power on the same side, the right. Among other tests it was found that the voice was heard at 15 feet with either ear, a whisper at 2 feet on the right and 15 feet on the left side. Bone-conduction to C (128) was − 14 sec. on both sides. The right ear was tested with the left tightly packed with cotton-wool and covered. As the results were remarkable, the ear was again tested, using Bárány's noise producer to absolutely exclude the left ear, when it was found that the hearing power of the right side was nil. Lake has found that with the ear blocked the tuning-forks C_3 and C_4 held near the opposite (in this case quite deaf) ear could be heard within 30 and 45 seconds of their ceasing to vibrate. It is therefore possible that such sounds, while perceived by the normal, may be attributed to the deaf ear, and this might apply also to lower-pitched tuning-forks, if they were struck so as to obtain overtones. Probably a contributory factor in such cases is that the loss of one ear entails the loss of the sense of sound direction, a sense which in man is but poorly developed.

Fraser[4] gives a full and detailed account of 33 cases of *congenital syphilitic disease* of the ear. Accurate observations on the histological pathology of this condition are still wanting. The opinions held by various authorities are: (1) That a primary labyrinthitis occurs in which the vestibular and cochlear apparatus are both affected; (2) That a hæmorrhage secondary to disease of the blood-vessels occurs into the labyrinth; (3) That inflammatory processes occur in the meninges of children affected by congenital syphilis, accompanied by an interstitial inflammation of the acoustic nerve. This inflammatory process spreads to the inner ear, most frequently giving rise to irritation and sometimes to inflammatory exudation. The deafness is usually bilateral, sudden in onset, and generally comes on between the sixth and the fifteenth years. Hutchinson's teeth are present in 50 per cent of the cases, and interstitial keratitis occurs in nearly all

cases and begins three or four years before the onset of the deafness. Bárány has observed a case in which the vestibular apparatus only was attacked, the cochlea being spared, so that a whisper was heard at six yards. Most of the cases show signs of tubo-tympanic catarrh, with opaque, lustreless, and indrawn membranes. The irritability of the vestibular apparatus as investigated by the caloric and rotation tests was in most cases markedly diminished or absent. Treatment should be begun as early as possible, **Potassium Iodide, Mercurial** inunctions, and **Pilocarpine** injections being employed. Most cases come under observation late, and the prognosis is hopeless. In early cases the patient's best chance, which is very small, of retaining useful hearing, depends on the general practitioner making a correct diagnosis, and beginning treatment at once.

Mastoid Disease.—Randall[5] would advise the radical mastoid operation when the hearing cannot be improved beyond one yard for the whisper, nor the discharge stopped, nor fœtor controlled by a reasonable trial of thorough cleansing—this to include painstaking trial of probe, forceps, curette, and the intra-tympanic syringe. Labyrinthine involvement, as shown by vertigo, nystagmus, and loss of caloric reflex and bone conduction, constitutes one of the strongest indications for operation.

In discussing the contraindications to the radical mastoid operation, Croker[6] points out that in certain individuals hearing power is almost of as much value as life itself. Therefore, in patients in whom the hearing power of the other ear is already gone, the radical operation should only be performed as a last resource, i.e., in the presence of direct meningeal or septicæmic symptoms. In the case of children under 5 years, of age the radical operation should practically never be done for chronic suppurative otitis media, but a simple mastoid opening made and the wound kept open until the middle ear is dry, and if necessary the opening up of the mastoid antrum and cells repeated. The operation should not be performed on a patient with tuberculosis or syphilis except in an emergency. Lastly, it should not be performed in any case of suppurative otitis media until the ordinary forms of middle-ear treatment have been faithfully carried out for at least six months.

In a long and interesting paper Ballenger[7] discusses the **Meato-mastoid Operation,** a name he has given to a modified radical operation in which the drum membrane and ossicles are not removed: the procedure was originated by Kuster some years ago. Speaking generally, he recommends this operation when simpler measures have failed to cure a chronic suppurative otitis media, and such a measure promises to establish adequate and permanent drainage and to remove the morbid material. Such cases would be those in which the necrotic process is limited to the mastoid antrum and cells. The author thinks that the operation may succeed in spite of slight diseased processes in the tympanic cavity; extensive necrotic changes here would, however, render the operation unsuccessful. This

operation is contraindicated in cases of cholesteatoma of the tympanic cavity, extradural and brain abscess, extension of the suppurative process to the labyrinth, all of which call for the radical mastoid operation in order to fully expose the site of infection and allow of further operative procedures.

Writing on *intracranial disease* complicating middle-ear suppuration, Logan Turner[8] states that, according to Hegener, out of 10,187 cases such complications occurred in 82, i.e., in rather more than ½ per cent. Körner found, in a series of 115 intracranial complications, phlebitis of the lateral sinus 41 times, meningitis 31, and brain abscess 43, and the majority of observers agree that cerebral abscess occurs twice as frequently as cerebellar. Brain abscess is found more frequently in men than in women. A detailed account is given of 14 cases of intracranial complications occurring in the author's practice. Ophthalmoscopic examination showed that changes in the disc are by no means constant in such cases, in fact are more frequently absent than present. In the eight cases observed of sigmoid sinus thrombosis, seven were characterized by one or more typical rigors, with swinging temperature; in the exception the predominating symptoms were those of meningitis, with intense headache, retracted head, and tenderness on percussion. In the cases of leptomeningitis the chief point of interest lay in the fact that they showed the predominant part the labyrinth plays as a pathway of infection to the interior of the cranial cavity. Hinsberg has previously published statistics showing that out of 198 cases of suppurative labyrinthitis (which is a complication of suppurative otitis media) 104 were fatal, and of the latter, 60 had leptomeningitis. Special reference is made to the occurrence of the *Proteus vulgaris* organism. It is not supposed in itself to be a source of danger, but when it is associated with the presence of cholesteatoma it leads to a decomposition of the latter, with resulting products which are very dangerous. The diagnosis of leptomeningitis is not to be regarded as a contraindication to operation, but as an indication for immediate operation in order to remove the primary focus of infection in the middle-ear cleft, and by repeated lumbar puncture to remove, as far as possible, the infected cerebrospinal fluid. In the treatment of sinus thrombosis the author's practice is to ligate the jugular vein in the neck, remove the clot, and syringe the vein through, in order to destroy the main focus of systemic infection.

In a paper on the diagnosis of *otitic lepto-meningitis*, Mygind[9] states that this condition differs from the "meningeal irritation" or "meningismus" so frequently seen in children during the course of acute otitis media, in that true meningitis (1) Appears some time after the onset of the ear trouble; (2) Starts with great suddenness and intensity; (3) May exist without symptoms of retention or mastoid abscess; (4) Runs its course with increasing severity of symptoms; (5) Is unusual in infants. Tuberculous meningitis differs from otitic meningitis insomuch as it (*a*) Is secondary to other tuberculous manifestations; (*b*) Begins with a preliminary or prodromal stage;

(*c*) The symptoms are less violent, and the temperature is usually lower; (*d*) Exhibits focal brain symptoms more frequently, and is very rare in people over forty. Great stress is laid on **Lumbar Puncture,** as an aid to diagnosis. If the cerebrospinal fluid withdrawn is opaque or turbid, it must be regarded as a certain sign of meningitis; on the other hand, a clear fluid does not of necessity exclude this condition. Pronounced deafness, especially loss of bone conduction and loss of labyrinthine reflex (i.e., nystagmus directed to the opposite side on syringing with cold water), point to the labyrinth as the pathway of infection to the meninges.

TREATMENT.—Ferran[10] reports very favourably on the employment of **Hot Air Inflations** in the treatment of middle-ear affections. His apparatus consists of a simple Politzer's bag prolonged by an aluminium neck containing an electrical resistance. By making a current pass through a 10-candle power lamp, heat which reaches 70° C. or 80° C. is obtained in four or five minutes. The inflations were made in some cases daily, but as a rule, twice weekly. No improvement whatever resulted in cases of otosclerosis, and the greatest benefit accrued in cases of chronic catarrhal otitis media with more or less tubal stenosis.

Lake[11] considers the treatment of certain rather intractable forms of deafness:—

1. *Cases of slight unilateral deafness,* in which no departure from the normal can be detected in the tuning-fork tests, but only a diminution in the distance at which a whisper is perceptible. Such cases are not improved by inflation of the middle ear, and are due to early nerve lesions. **Electrical Treatment** seems to offer the only hope of amelioration.

2. *Cases of well-marked deafness* with a double negative Rinne test and fixation of the malleus due to cicatricial changes in the middle ear following previous inflammatory attacks. After a thorough trial of inflation, the use of drugs, and careful nasal hygiene, **Oto-massage** should be employed, and the hypodermic injection of **Fibrolysin** or the internal administration of **Thiosinamine.** These measures all failing, the malleus should be forcibly mobilized with a steel probe under general anæsthesia, or under the local anæsthesia of Neumann. Inflation and oto-massage should then be employed for some little time.

3. *Cases of otosclerosis.* He strongly recommends the employment of **Oto-massage,** together with the injection of 1 per cent **Red Iodide of Mercury** in a fluid ointment. It is important that the machine employed be capable of producing a high rate of velocity, up to 15,000 or 20,000 vibrations a minute. Generally speaking, this method is contraindicated in cases of deafness with a positive Rinne's test or when suppuration is present.

Gay French[12] gives his experience of the use of **Fibrolysin** in the treatment of deafness and tinnitus. The method employed was to inject 30 min. subcutaneously into the upper arm and to insufflate 5 min. through the Eustachian catheter into each middle ear. After an interval of fifteen minutes, massage was applied to each side for

from three to five minutes by means of an oto-masseur. This routine was repeated twice a week for six weeks. The 68 cases treated were those of (1) Post-suppurative middle-ear catarrh, with cessation of discharge but formation of scar tissue and ankylosis of the ossicles, 21 cases; (2) Chronic dry middle-ear catarrh, 47 cases. Of the first series of cases, 16 had tinnitus, 5 had no tinnitus. Of the 16 with tinnitus, 4 were complete failures; 6 had no improvement in hearing, but stated that the noises were less; while 2 stated that the noise had completely ceased; 6 showed good improvement in hearing to the tests, and the noises were much diminished in 3, completely ceased in 2, and were no better in 1. Of the 5 cases with deafness but no tinnitus, 2 showed improvement, 3 none. Of the 47 cases of dry middle-ear catarrh, 36 had tinnitus, and 11 had no tinnitus. Of the 36 with tinnitus, 11 were complete failures; 8 showed no improvement in hearing to the tests, but stated the noises to be diminished; and 17 showed improvement in hearing to the tests, and of these 6 stated that there was no diminution of the noises, 8 that they were diminished, and 3 reported the noises to have quite ceased. Of the 11 cases without tinnitus, 7 showed improvement to the tests and 4 showed no improvement. As regards the permanency of the results obtained at the end of a year or more, in the majority of cases a slight return of tinnitus or increase of deafness occurred; but in only two cases were the conditions as bad as before treatment. The author is of opinion that injections of fibrolysin form the best mode of treatment for post-suppurative catarrh and adhesions.

The indications for the operation of **Ossiculectomy** are, according to Phillips:[13] (1) The continuance of a purulent inflammatory process in the middle ear in spite of conservative treatment when there is reason to suppose that the diseased process is chiefly confined to the drum membrane, ossicles, and tympanic walls. (2) After recurrence of polypoid proliferations, unless such recurrence is associated with evidences of extensive necrosis in the aditus, mastoid antrum, or labyrinth. (3) As a preliminary to the radical operation in patients who have never had any complicating symptoms, and in whom there is hope that better drainage, combined with persistent local treatment, may succeed; or in patients who will not submit to the radical operation except as a last resource.

A **Simple Mastoid Operation** is indicated whenever there is extension of an acute suppurative process to the mastoid antrum and cells, with the following signs: (1) Pain, deep-seated and continuous over the mastoid region. (2) Tenderness on pressure over the mastoid cortex; this may be entirely absent. (3) Drooping of the postero-superior wall, and bulging of the membrane, which does not diminish after paracentesis. (4) Fever, more marked in infants and children. (5) Discharge, if this continues for six weeks in spite of free incision of the drum membrane and efficient local treatment. (6) Sub-periosteal post-auricular swelling. (7) The onset of symptoms of intracranial complications, or the advent of facial paralysis, which on account

of the intimate connection between the facial canal and labyrinth is of serious import. (8) When a blood-count shows a high leucocytosis and polynuclear percentage. It is not wise, however, to operate on every patient who has tenderness over the mastoid region; during the first three or four days of the attack, a free incision of the membrane will frequently suffice.

The **Radical Operation** is indicated: (1) When a permanent cessation of the discharge has not been procured by intratympanic measures or removal of necrosed ossicles and curettage of the middle ear; (2) When symptoms of acute mastoiditis supervene in the course of a chronic suppurative otitis media; (3) When a cessation of the purulent discharge is associated with chills, fever, vertigo, and pain; (4) On the appearance of facial paralysis or attacks of nausea, vertigo, and vomiting; (5) In all cases of intracranial complications or lateral sinus involvement; (6) In the presence of cholesteatoma or fistula in the cortex.

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ECZEMA. *E. Graham Little, M.D., F.R.C.P.*

In acute papular and vesicular eczemas, Bunch[1] recommends powders, pastes, or lead lotion, and deprecates any idea of "killing off" the disease by "radical" measures. In chronic eczema, with thickened plaques of disease, **Massage** followed by **Salicylic Acid** plasters or ointments, or preparations of **Oil of Cade** or other tarry applications. The following paste is useful, especially in greatly thickened patches:—

R	Lenigallol	gr. xl	Kaolini	℥iss	
	Ol. Cadini	♏xx	Vasilini	ad ℥j	
	Zinci Oxidi	℥iss			

The especially rebellious eczemas of the scrotum, anus, and vulva are best treated by the **Paquelin Cautery** under general or local anæsthesia, and the subsequent application of 5 per cent solution of borax compresses. The itching of eczema may be checked by cold water compresses; 2 to 10 per cent solutions of menthol in alcohol or oil are often efficacious, or 1 to 2 per cent solution of salicylic acid in alcohol, or the following lotion: —

R	Acid. Carbol.	gr. iv	Spt. Vin. Rect.	ad ℥j	
	Glycerini	♏ xl			

Apply on cotton-wool or a sponge.

The use of crude **Coal Tar** advocated by Brocq has been further recommended by Jamieson and Cranston Low.[2] A weeping eczema covered with crusts or scales, should be cleansed by moist dressings applied for twenty-four to forty-eight hours, and all pustules opened and touched with nitrate of silver. The whole area should then be washed with boiled water, or even, when not too sensitive, with soap

or cotton-wool soaked in ether. The coal tar is then put thickly on, and allowed to dry for from twenty minutes to several hours, when it is freely dusted over with talc, and bandaged. The dressing may be left for two days; if at the end of this time the skin remains uninflamed, fresh talc may be again dusted on, and the tar left for five to six days. If the skin is oozing, smarting, or tingling, the tar should be removed by dressing the surface with plain or ichthyolated zinc paste, and a second application of tar made on the fifth to the seventh day. Jambon[3] modifies the method by using a preliminary wash of methylene blue (1–150, 1–200), and substitutes for the talc a dressing of two or three layers of unstiffened gauze.

Stern[4] recommends the following lotion in "almost all types of eczema":—

R	Plumbi Acet. Cryst. ℥ij Aluminis Crudi Pulv. ℥iv	Aquæ Dest.	℥viij

This is diluted with 4 parts water; sterilized gauze is saturated in it and applied on the lesion, covered with oil silk, and tied on. This should be renewed every three or four hours; later, 5 to 10 per cent **Ol. Rusci** with zinc ointment is applied and dusted over with talc, and bandaged. For hairy parts, ol. rusci 1, ol. olivæ 3, may be painted on the diseased areas. A lotion of **Methylene Blue** (3 per cent aqueous solution) may be useful in small patches, which are then to be painted over with fluid collodion. Stern finds **X Rays** largely useful in many chronic eczemas which resist other means.

Talmage[5] gives some hints on the management of chronic eczema, which may be summed up as follows: Meat should be restricted to one meal a day; butter and vegetables, stewed fruits and water, may be freely given; alcohol is forbidden. Exercise, and if necessary laxatives, must be prescribed to combat constipation. Constitutional causes must be investigated and treated. Nearly all patients, it is said by the writer, are benefited by the taking of moderate doses of **Potassium** acetate, citrate, and bicarbonate three times a day in water. Universal eruptions should be treated by soaking in warm alkaline baths once a day for fifteen minutes, mopping the surface dry with a hot towel, and massaging the skin with carron oil to which ¼ per cent carbolic acid is added. Cotton underclothing is recommended. Often the hands and feet are scaly and hardened. This condition is to be treated by wearing rubber gloves and socks; the scales may be removed by scrubbing with soft soap liniment; fissures and cracks are best treated with **Silver Nitrate** solution (10 to 20 per cent). Where occupation is responsible for the outbreak, this must be stopped, or at least intermitted. For eczema of the nails and nail-bed, the wearing of rubber finger-stalls, and the soaking of the nail in silver nitrate lotion 10 to 15 per cent, are recommended. For eczema of the scalp, the head is to be shampooed every three nights with soft soap liniment, dried with a hot towel, and the surface massaged with:—

R	Sulph. Præcip. ℥j	Ol. Olivæ	℥j

Or later, with the following :—

R Ol. Cadini ℥xv ad ℥ij | Ol. Olivæ ℥j

For softening the scabs on the scalp a rubber cap may be worn.

In eczema of the beard, the hair should be epilated in the diseased areas and **Lassar's Paste** (with 15 gr. to the ounce of acid. sal.) applied ; if there is much scaling, oil of cade 20 drops to 1 dr. of olive oil may be substituted. Eczema of the meatus of the ear should be treated by checking the discharge which is often the underlying cause, and applying diachylon ointment to the canal ; if the surface is fissured, a lotion of silver nitrate (15 gr. to the ounce) should be painted on. Eczema of the eyelids should be approached by remedying conjunctivitis if present, and anointing the lids with a 1 per cent ointment of **Yellow Oxide of Mercury** in vaseline. The lids should be prevented from adhering by smearing them with vaseline.

In chronic eczema of the legs, where there are ulcers, these should be treated by bandaging from the foot upwards, and painting the site of the disease with 1 per cent **Methylene Blue** aqueous solution every other day.

In eczema of the nipple, the presence of the milk acts as an irritant ; the nipples should be carefully dried after suckling ; a 5 to 10 per cent lotion of **Silver Nitrate** should be painted on the affected area. In eczema of the genitals, including the anus and gluteal region, cotton under-garments must be used ; irritation may be relieved by steaming the parts by sitting over a vessel with boiling water, to which **Glycerin of Phenol** may be added ; the parts may be swabbed over with cotton-wool soaked in the hot solution ; they may subsequently be painted with solution of silver nitrate (10 to 30 per cent). Parts which rub against one another should be separated by pledgets of cotton-wool, kept in position by bandages.

Franklin Clark[6] strongly recommends the following ointment in eczema, both acute and chronic :—

R Ung. Zinci Benzoati ℥j | Acid. Salicylici gr. v
Pulv. Resorcini gr. xx |

Hartzell[7] contributes a scholarly and philosophic paper on the etiology of eczema. He supports the view (with which I am personally in entire agreement) that dermatitis produced by external irritants, when showing the clinical symptoms of eczema, should be classed as eczema irrespective of the cause, and he relies more upon local than general treatment, laying stress on the importance of tracing the producing external cause. A small proportion only of cases of eczema are to be attributed to internal causes, the rôle of which has been greatly exaggerated.

I may perhaps be forgiven for referring the reader to a paper on this subject which I contributed to the *British Medical Journal*, for my personal views on the question of classification and treatment.

References.—[1]*Lancet*, Apr. 3, 1909 ; [2]*Edin. Med. Jour.* May, 1909 ; [3]*Ibid.* ; [4]*Med. Rec.* May 8, 1909 ; [5]*N.Y. Med. Jour.* Feb. 6, 1909 ; [6]*Ibid.* ; [7]*Jour. Amer. Med. Assoc.* Nov. 28, 1908.

ELBOW JOINT. (*See also* DISLOCATIONS.)

Priestley Leech, M.D., F.R.C.S.

Arthroplasty for Ankylosis.—Scudder[1] recommends this procedure in cases in which a diseased process has subsided (tuberculosis, gonorrhœal arthritis, etc.), and in those in which an old fracture of the elbow exists, as giving a more useful joint than excision. Ankylosis of the elbow in youth below the age of union of the epiphysis to the diaphysis should not be treated by operation. In the case he describes very good motion was obtained. The operation he performed was as follows: Transverse section of the olecranon to secure access to the obliterated joint surfaces; a chisel separates the bony surfaces, and sufficient bone is removed from the humerus and olecranon to fashion a fairly naturally-shaped elbow joint; full flexion and extension are demonstrated, and all synovial membrane is removed. A rectangular fascial fat flap (Murphy) is then taken from the fascia overlying the triceps far up the back of the upper arm, and this flap is transferred to the space between the two bones forming the new elbow joint. The pedicle of the flap is just above the elbow joint on the back of the upper arm. The free margins of the flap are caught loosely to the peri-articular tissues to prevent dislodgement. All bony surfaces entering the new elbow joint are completely covered by the flap. The divided olecranon is sutured with aluminium bronze wire, and the soft parts are closed tightly about the joint in two layers. A removable internal angular splint is worn for some six weeks. Limited passive motion is begun less than two weeks after the operation.

REFERENCE.—[1]*Ann. Surg.* Nov. 1908.

ELEPHANTIASIS. *J. W. W. Stephens, M.D.*

C. W. Daniels,[1] in a discussion on lymphatic diseases in the tropics, refers especially to the question of the filarial origin of elephantiasis. In defining lymphatic obstruction, he includes not only gross elephantiasis of the legs, but also cases in which, together with slight elephantiasis of the skin, there is very marked non-suppurative glandular enlargement or lymphatic varix. His results for British Guiana may be tabulated as follows:—

	NEGRO DESCENT.		EAST INDIANS.		PORTUGUESE.	
	M.	F.	M.	F.	M.	F.
Elephantiasis, including glandular enlargement, etc. ..	11·6	16·7	1·0	1·4	25·2	39·2
F. bancrofti (Larvæ) in blood	17·2	28·0	6·4	5·9	23·5	32·0

It is not stated what the filarial rate is in those not suffering from any elephantoid affection.

Similar figures have been published for other countries, and the close relationship is confirmed wherever carefully examined. The objection that among cases of lymphatic obstruction the percentage of those

showing *F. bancrofti* larvæ in the blood is less than in the general population is explained by the fact that the obstruction is always between the adult worms and the superior vena cava, so that the larvæ cannot get into the circulation.

Considering next the question of the mode of production of the lymphatic obstruction, it is pointed out (1) That a worm in a vessel causes thickening, dilatation, or other changes in the vessel; (2) That a worm apart from this *may* have injurious actions, e.g., occasionally hæmorrhage occurs into the dilated lymphatics; (3) That suppuration and abscess formation result in some way from the presence of the worms or their death. The lymphatics altered in this way are more liable to inflammation, and the entrance of bacilli may cause lymphangitis. The author finally supports Manson's hypothesis that under certain conditions the adult, instead of depositing larvæ, lays eggs—and the shortest diameter of these is greater than the smallest lymphatic channels—and eventually these eggs block up all the anastomosing channels in a gland, so that eventually there is complete obstruction of that system. (NOTE.—it must be remembered that these eggs have never been seen forming such a block). This blocking is probably not permanent, as the thin-shelled eggs would soon be destroyed, but some irritative change may arise sufficient to cause permanent blocking.

In the discussion which arose, Manson expressed the view that a filaria in the leg could produce, owing to the connection of the lymphatics, a lymph-stasis in the leg it was lying in, in the scrotum, and in the opposite leg. Powell pointed out that filariæ were common in the lymphatic channels and subcutaneous tissue of birds, but that no elephantoid conditions occurred in them.

TREATMENT.—Castellani uses **Thiosinamine** injections combined with constant pressure on the affected parts. Either factor alone is practically useless. An injection of 0·2 to 0·4 gram of thiosinamine dissolved in glycerin and water, or of **Fibrolysin** (Merck) 2 to 4 cc. daily, for three to six months is given. The injection is occasionally interrupted for a few days. The injections are made deeply in the gluteal regions. After each injection the limb is tightly bandaged with flannel bandages. The pressure must be carefully distributed, or the unpressed parts swell. In verrucose elephantiasis a lotion of the following composition is useful in removing the callosities :—

℞	Ac. Salicylici Resorcini	āā ʒj	Sp. Vini Rect.	℥iv

In successful cases, after three to six months the affected parts are much smaller, and the skin is smooth and more elastic. In addition, the author recommends removing long elliptical strips of tissue and stitching the margins together, a procedure that would not be possible before treatment.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 31, 1908; [2]*Ibid.*; [3]*Ibid.* Jan. 2, 1909.

ELEPHANTIASIS, TUBERCULOUS. (*See* TUBERCULOUS ELEPHANTIASIS.)

EMPHYSEMA (Surgical Treatment). *Rutherford Morison, F.R.C.S.*

M. Lambert[1] writes that in an article in the *Semaine Médicale*, 1907, page 529, M. Lejars related three cases in which Freund's operation (*see also* TUBERCULOSIS) had been successful, but mentioned that they were too recent in date and too few in number to allow of a definite practical value being assigned to the operation. In view of these remarks, the following case of M. Lambert's is of interest: The patient, a man aged 35, was treated at the S. Sauveur Hospital at Lille for pleurisy in 1902. Since then he had suffered from dyspnœa, with paroxysmal crises more and more severe. The chest was barrel-shaped and had but 1 centimetre of expansion, the costal cartilages were hypertrophied and deformed, and the face was cyanosed. There was no fever, albuminuria, or œdema. On November 10th, 1907, M. Lambert resected 1 cm. of the 2nd, 3rd, and 4th costal cartilages, and fixed a strip of the pectoral muscle in the wound. There was considerable hæmorrhage, but otherwise the operation, which was easily performed, was uneventful. The next day the patient breathed easily and was greatly relieved, but he died after half an hour of asphyxia the night following. The autopsy revealed acute œdema of the lung and subpericardial ecchymoses. There were pleural adhesions on the right side. The œdema supervened thirty-six hours after operation. Was it coincidental or a result of the operation?

REFERENCE.—[1]*Sem. Méd.* July 22, 1908.

EMPYEMA. *Rutherford Morison, F.R.C.S.*

The recognition and proper treatment of empyema is of the greatest practical importance, because it is a relatively common disease and, if not satisfactorily dealt with, a very fatal one. Children are its chief victims; in at least nine out of ten cases it follows pneumonia, and it is curable by a very **Simple Operation.** If, after an attack of pneumonia, convalescence is not straightforward, the first suspicion aroused should concern empyema. The physical signs which have been thought to indicate pneumonia do not clear up in the ordinary way, the temperature assumes the pus type—high in the evening, low in the morning. Sweating about the head occurs at night, and the patient has the grey, pallid complexion of chronic toxæmia. Under such conditions no time should be lost in exploring the chest. The exploration can be well done with a good hypodermic syringe in the 7th intercostal space behind the midaxillary line. Needless to say, this and subsequent proceedings should be done with all surgical care, for the result depends, more than anything else, on the avoidance of further infection of the pleura. If pus is found by the needle, the sooner operation is performed the better.

The operation should be done under a general anæsthetic: chloroform until the patient is unconscious, then open ether till the end. The patient, lying on his back, is drawn to the edge of the table, so that the diseased side projects as a convexity beyond the edge of the

table. This opens up the intercostal spaces. The operator kneels or sits on a low stool in such a position as to have access to the side partly from below. After the hypodermic needle has shown again the presence of pus, the syringe is unscrewed, leaving the needle as a guide. A *vertical* incision is then made, with its centre level with the puncture and by the side of the needle, about 1½ in. long. The vertical incision obviates kinking of the tube, which is likely to follow the usual oblique incision. When the muscles are exposed, the needle is withdrawn to avoid breaking it into the chest, and a director is driven into the pleura at the same spot. Along the groove in the director a pair of closed strong sinus forceps is pushed, and withdrawn open, *transversely*, care being taken to maintain the director in position. Through the hole so produced in the intercostal space, 2 in. of drainage tube, with a safety pin to prevent the tube from slipping in the outer end, is guided by forceps into the pleura along the groove in the director, and the operation is complete. No washing out or other interference is necessary or desirable; indeed this simple operation gives better results than any other. The discharge ceases at the end of a few days if the dressing is frequently changed and antiseptic precautions have been adopted throughout, for these are essential to success. As soon as the pleura discharges no more pus, usually in a week, the drainage tube should be removed; and now, unless special precautions are taken, disappointment may follow. After a few days of normal temperature, an evening rise means reaccumulation of pus from too early closure of the opening. This is to be avoided by passing a director into the opening daily after removal of the tube to ensure its patency, and so long as there is any discharge this should be continued. If the chest has not healed in three weeks, something has gone wrong, and a further operation is probably necessary. Old empyemata may be cured by operation or operations, but they demand courage and patience from both surgeon and patient, and neither can count on a certain reward.

Hale White,[1] in a lecture on empyema, says of the patient presented that she had an empyema following pneumonia, and was coughing up pus from a cavity on the right side of the chest about the 2nd, 3rd, and 4th ribs, between the sternum and anterior axillary line. She was very ill, and had a hectic temperature on admission. The first thing done was to put her to bed on the balcony, so that she should spend her days and nights in the open air; the next to make cultivations from her sputum, which contained the *Bacillus coli*, the *Pneumococcus*, and *Staphylococcus aureus*. Then her blood was examined in order to ascertain its opsonic index to those micro-organisms. This made it clear that the lowest opsonic index was that of the *Bacillus coli*, and a vaccine was prepared from this and several injections of it were given. After the first week of the treatment her temperature had fallen, and declined still further each succeeding week, till in the fourth week it was normal and had remained so. She had also gained 7 lb. in weight whilst under this treatment, and all

the physical signs had improved to such an extent that her chest was nearly normal.

If the septic symptoms are severe, even though the patient may be coughing up pus, it is necessary to operate. A dose of morphia to prevent coughing may help the exploring needle to find pus. An X-ray picture is also of service in finding the pus collection. All empyemata operated upon do not do well, and if the patient is coughing up pus and is not poisoned by absorption, many will get well with **Open-air Treatment.** Fresh air and **Yaccine** together make an excellent form of treatment, and many unpromising-looking cases get well with it. If the signs of pneumonia do not disappear in the usual way, there is an empyema. For diagnosis, put the needle in at a tender spot. Do not evacuate the pus suddenly, but drain it off before exsecting a rib.

Albert Vander Veer[2] mentions the danger of paracentesis in the pre-antiseptic era, during the United States Civil War of 1864. He relates his successful treatment during the same war of an officer, aged 21, who was shot through the apex of the left lung, the bullet entering through the 1st intercostal space in front and emerging just above the spine of the scapula. The patient was kept very quiet, and morphia and aconite were administered. The wound was kept clean by frequent washing with soap and warm water, and a saturated solution of chlorinate of soda, also the use of a silver drainage tube posteriorly. The anterior wound soon healed, but the posterior sinus persisted for a further three months. In January, 1909, the writer saw the patient, and the lung was quite normal in its function. He considers that had the large amount of blood been imprisoned in the pleural cavity by the application of a collodion dressing, a fatal result must have followed. By the year 1890 he had made up his mind that a sterile pleuritic effusion was best treated by medical means, but that directly sepsis supervened, free drainage was necessary for a cure, the rib being resected if necessary.

George E. Waugh,[3] in a paper with notes from 55 consecutive cases, favours treatment by **Resection of Ribs.** The principles on which his opinions are based are efficient drainage and removal of the maximum amount of septic material at the time of the operation. Delay from uncertain diagnosis he thinks is the chief cause of chronic trouble after operation, and this delay arises largely from the fact that displacement of the viscera (heart, liver, spleen) from fluid pressure are relied upon for purposes of diagnosis. This, however, is a late sign, because the lung is entirely compressed before it can occur. In 41 consecutive cases, displacement of the viscera, though carefully looked for, was only observed in 19, and it was also noted that a large amount of fluid might be present without observable displacements, and a small amount might cause decided shifting of the heart.

P. T. O'Connor[4] says that in estimating the value of a surgical procedure surgeons must not only remember the mortality of the operation, but the disability and the permanence of cure resulting

from it. Early diagnosis may always be made with the aspirator, and there is no excuse for missing it. Rapid recovery is then to be expected. As regards chronic cases, in 1893 Fowler, in a case with sinus, secured healing by decortication. Delorme makes a temporary resection of the chest wall, decorticates the lung, cleanses the cavity, and replaces the flap of chest wall, providing for drainage. Joseph Ransohoff, instead of decortication, divides the pulmonary pleura by many parallel and right-angle incisions. Lloyd introduces his hand into the pleural cavity after the pus has been drained away, and separates all adhesions. For drainage of the pleura, resection of a rib is the operation of choice. It can be performed with local anæsthesia except in children and nervous persons. If it is necessary to introduce a finger, more than one rib requires resection. Bryant advocates aspiration drainage of the chest by means of a collapsible rubber ball attached to the outer extremity of a drainage tube. Ochsner practises through-and-through drainage.

Emil G. Beck[5] advocates the use of a 33 per cent **Bismuth-vaseline Paste** in the sinuses resulting from tuberculous empyema. The use of it had been followed by more successful results than in ordinary sinuses, and if signs of poisoning developed, the paste could be removed by hot oil. The cavity should not be distended by bismuth.

Albert J. Ochsner[6] says that in the persistent sinuses and abscess cavities following operations for empyema, treatment by Dr. Emil Beck's paste has given excellent results, and a synopsis is given of fourteen cases where this was adopted. The method consists in filling the sinus or pus cavity with one of two solutions of bismuth subnitrate and keeping this in position by plugging the outer opening with gauze. Solution No. 1 consists of one part of arsenic-free subnitrate of bismuth and two parts of sterile amber vaseline; solution No. 2 contains 30 parts of bismuth, 60 parts of amber vaseline, and 10 parts of paraffin of sufficient hardness to give the mass a fair degree of hardness at the body temperature. No. 1 is injected every second day until suppuration has almost disappeared, then No. 2 is injected in its place. The injections are repeated as often as necessary to keep the sinus or pus cavity constantly filled with the mixture. At first it is necessary to do this every day or every second day, then every third, and so on until it may be necessary to inject not oftener than once in a week or ten days. He is much struck with the marked improvement in the general condition of the patient; the discharge from the sinus usually becomes sterile in a short time.

References.—[1]*Clin. Jour.* May 26, 1909; [2]*Ann. Surg.* July, 1909; [3]*Lancet*, Feb. 6, 1909; [4]*Med. Rec.* Aug. 15, 1908; [5]*Ibid.* June 12, 1909; [6]*Ann. Surg.* July, 1909.

ENDOMETRITIS. *Victor Bonney, M.S., M.D., F.R.C.S.*

At the meeting of the British Medical Association at Belfast a discussion on endometritis was opened by Hastings Tweedy.[1] He divided the disease into acute and chronic varieties, of which the former was always of bacterial origin, whilst the latter included a

number of conditions not necessarily due to this cause. Acute endometritis was to be treated on general principles. Before douching the cavity a specimen of the discharge should always be secured for bacteriological investigation, and, if need arise, for the preparation of a vaccine. He did not favour the use of the sharp curette, as he considered that it opened up fresh channels for infection. In chronic endometritis **Curettage** was the proper treatment, after which he applied **Formalin** (1–3) on a Playfair's probe, and left a gauze wick in the uterus for twenty-four hours. In marked cervical endometritis he advised partial amputation of the cervix or dilatation of the canal, followed by a light application of the **Actual Cautery.** Fehling, of Strasburg, who followed him, thought there were cases of chronic endometritis which depended on general constitutional conditions, and that required no local treatment. He advised the wearing of a flexible intra-uterine stem after curetting. Donald strongly believed in gauze packing after curetting, and considered that erosion was due to the action of irritating discharge from the corporeal endometrium. He curetted the surface unless the cervix was much thickened, when he removed a wedge-shaped piece including the diseased area. Cullen, of Baltimore, stated that he had examined all the uterine scrapings removed in a large hospital for four years, and in only forty-eight cases was there evidence of endometritis. Munro Kerr agreed, and stated that many of the cases curetted were really examples of metritis, not endometritis.

Herman,[2] in a paper entitled "The Use and Abuse of the Curette," set forth his views on the proper use of that instrument in the forcible and dogmatic manner to which all readers of gynæcological literature are accustomed. In it he inveighed strongly against the indiscriminate use of the instrument, pointing out that certain practitioners were in the habit of curetting the uterus as a routine measure in all and sundry affections of the female genital organs, whether the uterus was obviously diseased or not. He disagreed with the practice of applying the curette in infected conditions of the uterus as a preliminary to abdominal operations for salpingitis, asserting that it is impossible to remove the whole of the infected endometrium. Further on in the paper he fell foul of the views of Donald with reference to the frequency of endometritis in virgins. According to Herman, endometritis in virgins is extremely rare, and it is unjustifiable to curette the uterus merely because the patient complains of chronic pelvic pain. Naturally this paper called forth a vigorous protest from Donald,[3] who maintained his opinion that endometritis in virgins is comparatively common. The symptoms, according to him, present a well-defined clinical picture, and consist of iliac or hypogastric pain, dysmenorrhœa, leucorrhœa, menorrhagia, and metrorrhagia. With these are usually associated an abnormally small cervix or acute anteflexion; and in all cases, enlargement of the body of the uterus.

References.—[1]*Lancet*, Aug. 19, 1909; [2]*Brit. Med. Jour.* Dec. 5, 1908; [3]*Ibid.* Dec. 19, 1908.

ENURESIS. *Prof. G. F. Still, M.D., F.R.C.P.*

Kuhner[1] considers that the cases of enuresis fall into four groups, according to their etiology, viz., cases having a reflex origin, those due to local excitation, those due to constitutional fault, and cases dependent on psychological conditions.

The part played by adenoids, if indeed they play any part, in the production of enuresis, has been the subject of much difference of opinion. Williams[2] states that adenoids, according to the text-books, are one of the two commonest causes of nocturnal enuresis; the other is phimosis. It must be pointed out that, however widely current this view may be, there are good reasons for doubting whether the latter trouble has anything to do with enuresis, and it is quite certain that the operations both for removal of adenoids and removal of the foreskin have usually no permanent effect upon enuresis. Williams himself records a case in which removal of adenoids, so far from curing the enuresis, evidently aggravated it.

Mentzikovsky[3] finds that enuresis is usually due to one of two causes; either an excessive sensitiveness and vascularity of the mucous membrane of the bladder and urethra, or an abnormal lack of sensitiveness in these parts; in the former cases, the passage of a catheter is almost impossible without a general anæsthetic, the slightest contact with the over-sensitive mucosa producing pain and resistance; in the latter, all sorts of manipulation are tolerated almost without any notice being taken by the patient.

Treatment.—On the strength of these observations Mentzikovsky has treated cases with daily applications of a local anæsthetic to the urethra, using a tampon soaked with a 1 per cent solution of **Cocaine Hydrochlorate** to which a minute proportion of **Adrenalin Solution** had been added. This treatment is, he thinks, of value for the cases with over-sensitiveness of the urethra; but for those with abnormally blunted sensitiveness he has used vesical injections of **Silver Nitrate Solution** 1 to 3 per cent, preceded by passage of a cystoscope, partly to observe changes in the mucous membrane, and partly to cause a certain amount of irritation about the sphincter of the bladder. Under such treatment the mucous membrane became more vascular and the sensitiveness of the mucosa was increased, and in about a month's time the incontinence was cured.

Williams (loc. cit.), arguing that in the case mentioned above, removal of adenoids had made the enuresis worse, assumes that this operation deprived the child of some internal secretion which had partially protected him against incontinence; that, in fact, the adenoids, instead of representing a superfluity of naughtiness on the part of the organism, had in reality been developed for some useful purpose. The thyroid has intimate relations with the lymph-glands, and adenoids consist of lymphoid tissue; on this ground he decided to try the effect of **Thyroid Extract.** To this child, aged 9 years, he gave at first ½-gr. tabloids (Burroughs & Wellcome) twice a day, and the effect was immediate cessation of the enuresis. He quotes Hertoghe, of Antwerp,

as having also insisted strongly on the curative influence of thyroid extract in nocturnal enuresis. Williams then treated 25 cases of enuresis with thyroid extract; one only failed to respond at all; of the remainder, some were brilliantly successful, all were improved, and in none were any untoward effects produced. He has used very large doses; for instance, to a boy of 3 he gave first 1½ gr. of thyroid extract, then 2½ gr., three times a day. Incidentally it was very noticeable that the children treated with the thyroid extract improved remarkably in general health. Regarding enuresis as being due to insufficiency of the internal secretion of the thyroid gland, in cases where adenoids are associated with enuresis, Williams suggests that if the thyroid extract alone is not sufficient to produce a cure, **Arsenic, Iodine,** and **Calcium,** all of which, he says, have direct relations with the function of the thyroid gland, should be used to reinforce its action.

In a subsequent article[4] Williams mentions certain untoward results of the thyroid treatment which, however, were easily disposed of by discontinuing the drug. Three children developed an enlargement of lymphatic glands at the angle of the jaw whilst taking the thyroid, and this enlargement disappeared when the drug was stopped. On the other hand, in one child who was under treatment for enlargement of glands in the neck, thyroid in small doses caused rapid subsidence of the glands. A severe attack of diarrhœa was also observed in several cases where large doses of thyroid extract were given; in some, the diarrhœa was associated with vomiting.

References.—[1]*Der Kinderazt*, Dec. 1906, in *Arch. f. Pediatr.* Jan. 1908; [2]*Lancet*, May 1, 1909; [3]*Sem. Méd.* Mar. 31, 1909; [4]*Polyclinic*, June, 1909.

EPIDERMOLYSIS BULLOSA. *E. Graham Little, M.D., F.R.C.P.*

Three cases of this rare condition are reported by Cane[1]: a mother and two children (males), with a history of the disease positive in them, and doubtful in several more antecedents, with no apparent selection of sex. The mother, aged 46, had had the disease before her marriage worse than after that date, but the commencement is not otherwise defined. The two children, aged respectively 15 and 14, had had bullæ since early infancy. Eosinophilia, which has been reported in these cases, was not noted in either of the two instances (the children) here examined. The mucous membranes were not involved; the teeth and eyes were good; no abnormal constituents were found in the urine. The eruption was always more marked in warm, moist weather. No treatment, either internal or external, seemed to exert any appreciable influence on the disease.

Reference.—[1]*Brit. Med. Jour.* May 8, 1909.

EPIDIDYMITIS, GONORRHŒAL. *Priestley Leech, M.D., F.R.C.S.*

Ernst,[1] of Charlottenburg, recommends the treatment by **Puncture** in acute epididymitis. In the early stages there should be rest in bed, ice applications to the testicle, and support of the latter by suspensory bandages; he thinks iced applications are better than hot ones in the early stages; in the later stages hot ones are better

to promote absorption. All instrumental and injection treatment is stopped, and rest in bed insisted on. If the pain is great, morphia is given either internally or in suppositories. Puncture of the epididymis was practised long ago by French surgeons by means of a bistoury. Latterly puncture by means of a syringe has given excellent results. An aseptic Luer syringe is used; the skin of the scrotum is disinfected, and the needle of the syringe is thrust to a depth of 1 to 2 cm. into the tail of the epididymis; the piston is withdrawn in order to aspirate, and then the whole syringe is withdrawn. When care is exercised, the patient complains of very little pain. A single puncture suffices as a rule, although some surgeons have used several. The fluid withdrawn was as a rule very small in amount, and consisted usually of a few drops of serous, sanguinolent, or turbid fluid; microscopically pus corpuscles were found, and gonococci with certainty in only five cases. If a hydrocele is present, this is first tapped in order to facilitate finding the epididymis. After tapping, the scrotum is raised and enveloped in warm compresses. In most cases the pain and feeling of tension disappeared, and next day the temperature had often fallen to normal. The duration of the disease is also shortened, and he thinks a perfect *restitutio ad integrum* is also obtained.

REFERENCE.—[1]*Berl. klin. Woch.* Mar. 8 and 15, 1909.

EPILEPSY. *Purves Stewart, M.D., F.R.C.P.*

Our ignorance as to the true etiology of idiopathic epilepsy is still profound. The gross changes which have occasionally been observed in the cornu ammonis and elsewhere in the cerebral cortex are, in all probability, the results and not the cause of the disease. Until, therefore, we learn something of the essential pathology of epilepsy (and one's feeling at present is that it is probably produced by some variety of toxæmia), we must be content with empirical treatment. To many physicians the only remedies which are worthy of consideration are one or other of the **Bromides,** whether of potassium, sodium, ammonium, lithium, or strontium. For many years these constituted practically the whole treatment. A few years ago, Toulouse and Richet made a great advance by the introduction of a **Sodium-chloride-free Diet.** The withdrawal of salt from the patient's food renders a smaller amount of bromide efficient in controlling the epileptic fits. The best régime for an epileptic patient was recently studied by Shanahan, of the Craig Colony.[1] Shanahan maintains that three things are essential, viz.: diet, hygiene, and occupation, all of which are of equal importance with treatment by drugs.

To settle the diet scale of any individual case, a careful analysis of the urine and fæces should be made, whereby errors of metabolism, previously unrecognized, are often discovered and corrected. Gastro-intestinal toxæmia appears to have a considerable effect in aggravating or intensifying epileptic fits. Every epileptic should avoid alcohol, and many of them should also avoid tea or coffee. The diet of an

epileptic should be of the best quality, but plain and properly cooked, avoiding rich, greasy, and highly-seasoned foods. Lactic-acid-fermented milk is often useful to correct intestinal fermentation. Constipation should be carefully prevented by diet, exercise, and drinking abundance of water; an occasional mercurial purgative or a dose of castor oil is also advantageous.

Bromides are no longer given in the large doses formerly considered necessary, especially if sodium chloride be withdrawn from the diet. If status epilepticus develops, it is best controlled by full doses of **Chloral Hydrate** per rectum, to which may be added some **Tincture of Opium.** Inhalation of **Chloroform** may be required to control the fits until the chloral has time to produce its effect.

In female epileptic patients disturbances of menstruation are frequently present. In such cases the administration of **Thyroid Gland**[2] is often highly beneficial, both as an emmenagogue and as a preventive of nitrogenous toxæmia.

Some cases are specially resistant to bromide medication, even when combined with the measures above-mentioned. In these cases it may be convenient to try **Flechsig's Treatment by Opium** in gradually increasing doses for a period of six weeks. The dose starts with 9 centigrams daily, and on the forty-second day it reaches 1 gram per day. The opium is then stopped, and for the next six weeks large doses of potassium bromide (8 grams daily) are given. Then for four weeks the patient gets 6 grams daily, and the cure is terminated by a six-and-a-half months' course of 4 grams daily. Sedatives, such as **Hyoscine, Cannabis Indica, Gelsemium,** or **Borax,** sometimes give good results when bromide fails.

For the actual paroxysm, if the patient has an aura, he may sometimes ward off the attack by **Nitroglycerin** or by **Nitrite of Amyl,** especially in cases where there is initial pallor before the fit.

Calcium Salts have also been found useful as an alternative for bromides. Thus Litteljohn[3] obtained good results from the administration of **Calcium Lactate** in doses of 15 gr., three times a day; while Cicarelli,[4] by giving **Phosphate of Calcium** in doses of 30 to 45 gr. daily, obtained results as good as, and sometimes better than, those which the same patients had exhibited under ordinary bromide treatment.

REFERENCES.—[1]*Dietetic and Hygienic Gaz.* Mar. 1909; [2]*Jour. Amer. Med. Assoc.* May 22, 1909; [3]*Lancet,* May 19, 1907; [4]*Il Policl.* Jan. 31 and Feb. 7, 1907.

ERYSIPELAS. *E. Graham Little, M.D., F.R.C.P.*

DIAGNOSIS.—Milian[1] comments on the frequent absence of the sign which is so much insisted upon in text-books, namely the raised edge at the periphery of the zone of extension, and, as the result of his own observation in a very large number of cases, places more reliance on the following three criteria: (1) The sign of centrifugal maximum. The disease is most marked at the periphery of the zone affected, the maximum redness, swelling, and tenderness being found here; the area may change from day to day, but the periphery is always the

site of chief severity. (2) The ear sign. Affections which may be mistaken for erysipelas, subcutaneous inflammatory processes for the most part, stop short at the outer ear, where there is no subcutaneous cellular tissue. Erysipelas being a dermatitis, not a subcutaneous inflammation, may and does frequently involve the ear, which becomes shiny, red, and painful. (3) Pain on pressure. The local tenderness, especially (at the periphery) of the skin, is one of the most valuable and invariable signs, serving to distinguish the disease from acute eczema, ophthalmic zona, etc.

TREATMENT.—Ross and Johnson[2] give the result of the study of 50 cases of erysipelas treated by specific **Vaccine,** in which only one fatal termination occurred. Erysipelas is caused by the introduction into the lymph-spaces of the skin of the streptococcus of Fehleisen, the same organism which causes puerperal septicæmia, pyæmia, etc. Opsonic estimation of the blood in 16 cases showed diminution of the index to *Streptococcus erysipelatis* in 14; in 2 of the 16 cases the index was above normal, and these two cases were progressing favourably at the time of this record, and were doubtless instances of auto-inoculation. In the remaining 34 cases of the series of 50, inoculations were performed without opsonic estimation, with equally good results as in the 16 cases in which that precaution was adopted. The authors lay down the following general rules: (1) In the vast majority of cases opsonic estimations are unnecessary. (2) It is unnecessary (but probably of advantage) to prepare a vaccine derived from each individual case for administration to that case. A stock vaccine may be used, which should be composite and derived from several strains, the more virulent the better. (3) The more severe the case, and the less satisfactory the clinical response, the smaller should be the dose. (4) The site of inoculation should not be near the site of the disease.

The routine method usually adopted was to inject 10 million sterilized streptococci on the first visit if the case was severe; 20 million if less severe; on the second day the severe case would have a second injection of 10 million if it showed signs of improvement, the most important of which are clearing of the mental dullness, less local inflammation, and a fall of temperature. If no evidence of improvement is observable, the case should get 5 million on the second day. In the less severe cases, improvement is usually noticeable on the second day, and an injection of half the first dose, i.e., 10 million, should be made. Doses of from 5 to 20 million (the quantities being in inverse proportion to the severity of the case) should be given every second day, until a week after the temperature has reached normal and the erythema subsided.

Judd[3] has obtained excellent results in 82 cases with the following method of treatment. The entire area affected, and for a margin extending half an inch beyond this, is swabbed over with a 95 per cent solution of **Carbolic Acid**; this is left until a moderate blanching of the tissue is observed, when the surface is again swabbed over with

pure **Alcohol** until the whitened area again becomes pink. The method should be used over small portions of the disease at a time, and it may be applied to the hairy scalp, and contiguous to mucous membranes (e.g., alæ of nose, eyelids, and nipple). The patient may require stimulation with strychnine and whisky. One such application of carbolic acid followed by alcohol is usually sufficient; for after-treatment, moist dressings of saline or 1–20,000 bichloride solution are recommended, but especial warning is given against weak carbolic acid dressings, which may cause sloughing.

REFERENCES.—[1]*Med. Press*, Oct. 14, 1908; [2]*Jour. Amer. Med. Assoc.* Mar. 6, 1909; [3]*Med. Rec.* Feb. 13, 1909.

ETHMOIDITIS, SUPPURATIVE. (*See* NASAL ACCESSORY SINUSES.)

EXOPHTHALMIC GOITRE. *Robt. Hutchison, M.D.*

Murray[1] is of opinion that no case should be regarded as one of Graves' disease unless the pulse be ninety or more per minute and there is either slight exophthalmos, some enlargement of the thyroid, or tremor as well. If two or three of these symptoms are present the case should be regarded as a mild one of the disease. In more than 25 per cent of his cases exophthalmos was absent. Why this sign is present in one case and absent in another cannot be explained. Indeed, the whole pathology and causation of exophthalmos are obscure, and of the explanations which have been advanced, the only one which is at all tenable is that which ascribes the protrusion of the eyes to an abnormal development of the retrobulbar fat. At an autopsy this mass of fat presents a striking appearance, and may be seen even in cases in which there is such general emaciation that hardly any fat is visible in other parts of the body. In one of his cases the fat from one orbit alone weighed ½ oz.

TREATMENT.—The use of the **X Rays** still attracts much attention, and several writers (Price[2], Judd,[3] Holland,[4] and Pfahler[5]) report successful results. It is difficult to judge of the value of these reports, as in most cases other treatment was employed at the same time, but as no harm at least seems to be produced by the rays, there can be no objection to their having a trial.

The objections to **Operation** seem to be gradually disappearing, although in this country it is still far more seldom resorted to than on the Continent or in America. Here, again, it is very difficult to form an opinion as to the merits of the procedure. The following quotation from a paper by Warrington[6] gives some recent statistics on the subject: "Mayo has operated on 110 cases, with 9 deaths; only 2 in the last 64 cases. Fifty per cent made an early recovery; the other 50 per cent recovered practically completely, though at a later period. About 25 per cent suffer from occasional relapses of tachycardia and tremor. The exophthalmos is one of the last symptoms to disappear. Halsted, too, has had a large experience of successful operations. Lewellys Barker seems to consider that the chief duty of the physician is, after preparatory treatment, to find a trustworthy surgeon to remove

part of the gland. He says the indication for operation is a persistent thyro-intoxication, which medical treatment does not quickly relieve. Even with marked tachycardia, feeble heart, and psychopathic disturbance the risk of leaving is probably worse than the risk of operation. Professor Garré gives some careful notes on his cases. Of twenty patients on whom he had operated, and observed afterwards for five years or more, exophthalmos was absent in a third, greatly diminished in somewhat less than a half, as before in a quarter; the pulse-rate remained below 92 in a third, not below 100 in a third, and unchanged in four cases; the nervous troubles were absent in a third, present in two-thirds; the general health and weight had increased in half. He considers that, on the whole, 85 per cent show marked improvement, but does not believe that a true, complete cure has occurred after any operation."

Berry[7] points out very justly that such statistics as those quoted by Warrington are apt to be misleading, as many of the cases embraced in them are probably not examples of true exophthalmic goitre at all. His own conclusions regarding the question of operation are as follows: "Bad acute cases of typical Graves' disease should seldom be operated upon. If operation is undertaken, it should only be done after a prolonged course of medical treatment. Operation of any kind in these cases is usually exceedingly dangerous to life, and the prospect of complete cure is by no means very hopeful. The more chronic cases of Graves' disease involve much less risk of an immediately fatal result. Such cases often benefit in a remarkable manner from operation, either ligature of thyroid vessels, or excision of a part of the gland. Cure is, however, by no means certain or complete. Cases in which there is dyspnœa with stridor almost invariably demand operation. There exists a large group of cases of goitre in which some of the symptoms of Graves' disease are present, notably tachycardia, palpitation, tremor, sweating, and emaciation, but without marked exophthalmos. Such cases are eminently suitable for operative interference, usually by unilateral extirpation or some variety of enucleation."

The present writer is of opinion that the gravity and incurability of Graves' disease tend to be exaggerated. He has recently inquired into the after-history of a number of cases which have been treated in the London Hospital within the past five years, and has been surprised to find to what a satisfactory state of health the great majority have attained, and how small has been the mortality. This tendency to spontaneous amelioration of the disease must be borne in mind when estimating the value of surgical treatment.

Edmunds[8] reports on a further series of seven cases treated with the **Milk of Thyroidless Goats.** Five of these improved, but the results are certainly not very impressive. Here again, the writer appears to be imperfectly acquainted with the natural course of the disease, for he says, "it is true that a certain number of cases recover under medical treatment." The fact is that the great majority so recover.

Gullan[9] cites a number of cases in which improvement appeared to

be due to **Rodagen** or **Thyroidectin**, and thinks that where benefit has not followed the dose has been too small: he gives ½ to 1 dr. of rodagen or 5 gr. of thyroidectin three times a day. It must be remembered that rodagen costs about 3s. 6d. per ounce.

Jackson and Mead[10] recommend **Quinine Hydrobromide** (5 gr. in capsule three times a day), and claim to have obtained 76 per cent of cures with it. It should be noted, however, that they recommend the patient be told not to expect any benefit for a month, and that the treatment be continued for at least two years!

REFERENCES.—[1]*Brit. Med. Jour.* Feb. 13, 1909; [2]*Ther. Gaz.* Dec. 15, 1908; [3]*N. Y. Med. Jour.* Jan. 2, 1909; [4]*Med. Press*, Oct. 20, 1908; [5]*N. Y. Med. Jour.* Oct. 24, 1908; [6]*Med. Press*, Oct. 14, 1908; [7]*Clin. Jour.* Aug. 4, 1909; [8]*Lancet*, Apr. 10, 1909; [9]*Ibid.* Sept. 5, 1908; [10]*Bost. Med. and Surg. Jour.* 1908, p. 346.

EYE, INJURIES OF. *A. Hugh Thompson, M.D.*

In opening a discussion at the British Medical Association[1] on *Eye Injuries in relation to workmen's compensation*, Fergus pointed out that visual capacity may be resolved into several elements, namely, visual acuity, the light sense, the sense of alignment, binocular stereoscopic vision, and (he might have added) the visual field. The relative importance of any one of these varies with the nature of the employment. Thus, for a watchmaker perfect visual acuity is essential, but most manual workers can get on relatively well without being able to see $\frac{6}{6}$. For a carpenter, the sense of alignment is perhaps the most important. A chauffeur must have a good visual field if he is to guide his car clear of obstacles on either hand. Artistic work requires good binocular stereoscopic vision, which in many employments is by no means essential. Now in gauging the injury that a man sustains by the total loss of one eye the nature of his employment must be taken into account. The chief direct effects on his visual capacity, supposing his second eye to be sound, are that stereoscopic vision is destroyed, and the field of vision diminished. In employments where these two elements are not required, his earning capacity may be as great as before. On the other hand (as was pointed out by Harman) the importance to the average working man of good binocular vision is apt to be under-rated. Even in such work as brick-laying, the two-eyed man has a great advantage over the one-eyed man in judging of the positions of things. Though, exceptionally, one-eyed engineers and fitters may be good workmen, they are not so good as they would be with two eyes. And anyhow, it would be very unjust to award compensation merely on this basis, for though the direct immediate effect on the earning capacity may be small, there are two indirect effects which may ultimately be more important. In the first place the fact that a man has lost one eye makes it more difficult for him to get work from any new employer. Secondly, an even more important consideration is the greatly increased chance of complete disablement or even blindness from any accident happening to the remaining eye. It would therefore seem fair to assess compensation

by dividing it into three parts—the first to be awarded irrespective of the man's occupation, and calculated to represent a fair insurance against the risk of disablement owing to accidents or diseases attacking the remaining eye; the second to vary with the nature of the man's employment, calculated to compensate him for any loss of earning power directly resulting from the accident; the third to represent the disadvantage at which a one-eyed man is placed in the labour market, owing to the unwillingness of an average employer to engage him.

A Danger from Plated Instruments.—A case has been reported by Rockliffe[2] where cataract extraction was followed by panophthalmitis, without any apparent reason, until during irrigation of the eye a bright foreign body was noticed floating away with the lotion and was fortunately secured by the nurse. It turned out to be a piece of plating measuring about 1·5 mm. by 1·0 mm. A corresponding deficiency was found in the plating of the De Wecker's scissors that had been used at the operation. The particle must have dropped into the chamber unseen at the time, and the inflammatory action was supposed to have been set up by the copper and nickel plating. The two metals being in contact in presence of a saline solution would set up a comparatively strong electric current. Whether or not this is the true explanation, the danger of defective plating must be remembered not only by ophthalmic but by all surgeons.

REFERENCES.—[1]*Brit. Med. Jour.* Sept. 25, 1909; [2]*Ophth. Rev.* July, 1909.

EYE, THERAPEUTICS OF. *A. Hugh Thompson, M.D.*

Vaccine and Serum Therapy.—So far as eye diseases go, it must be admitted that apart from the use of tuberculin, which was fully dealt with in last year's *Medical Annual*, the various applications of vaccine and serum therapy have not as yet been attended with much success. In the case of those infections the cause of which is definitely known, such as gonococcal conjunctivitis or pneumococcal corneal ulcer, the disease can be more effectually attacked by direct methods. The general opinion on Römer's antipneumococcic serum is that its results are disappointing. In the case of wound infections and of sympathetic ophthalmia it is impossible to prepare vaccines or sera from the offending organisms, because we do not know what these may be. Nevertheless, attempts to attack these conditions by way of the blood have been made in two ways. One is that of Zur Nedden,[1] who injected the blood-serum of patients suffering from sympathetic ophthalmia into other patients in an early stage of the same disease. Another way is to inject a serum which is an antidote not only to the organism from which it is prepared but to other infectious organisms as well. Darier has for some years maintained that diphtheritic antitoxin has such properties, that it produces "antibodies" in the blood capable of counteracting all sorts of infections. Recently Deutschmann,[2] of Hamburg, has produced a "polyvalent" serum from horses (originally from rabbits) fed upon yeast. In its present form ("Deutschmann

serum E") he claims that it is effectual and absolutely harmless in such diseases as ulcus serpens (what new treatment has not been applied to this disease?), non-tuberculous serous or plastic iritis, and infective processes following wounds or operations. His claims are endorsed by Darier and von Hippel, but disputed by Axenfeld,[3] who tested the serum by experiments on animals. "Neither infections of the vitreous," he says, "nor those of the anterior chamber, nor of the cornea, showed any appreciable effect as the result of the yeast treatment on either the severity or the course of the disease." Darier replies that whatever be the result of experiments on rabbits, the clinical facts prove that sero-therapy almost always gives a chance of cutting short an infection taken at the beginning. Deutschmann's method of administration is by intramuscular injection two or three times a week, 2 to 4 cms. being an average commencing dose for an adult, to be reduced only when a decided improvement has taken place. He thinks that the unfavourable results reported are probably due to insufficient dosage.

Subconjunctival Injections.—The following solutions are recommended by Darier:[4] Sodium chloride 2 per cent; 1 cc. to be injected daily, or less often according to the intensity of the reaction. Cyanide of mercury 1–5000; 1 cc. to be injected every two or three days. The addition of a few drops of acoin (1 per cent) solution renders the injection painless. This method with the cyanide solution is recommended for the arrest of *infective processes* after wounds or operations—for cases of *corneal ulcer* with hypopyon, and for cases of *myopic choroiditis* or *chorio-retinitis* of central type and not too far advanced. In cases of endogenous infection special solutions are recommended. For *gummatous iritis* the cyanide injection; for *rheumatic episcleritis* or *iritis* a 1 or 2 per cent solution of salicylate of soda, for *tuberculous affections* guaiacol in the form of a 2 per cent solution of the cacodylate. Moreover, all the sera can be injected subconjunctivally. The only contraindication to this method is a circulatory stasis which would make the absorption of the medicament difficult or impossible. Another solution recommended is iodate of sodium 1–1000, said to be effective in cases of *glaucoma* (especially secondary glaucoma) in reducing the tension of the globe.

Diaphoresis as an Aid to Remedies.—At the meeting of the British Medical Association at Toronto in 1906, Dr. Burnham, of that city, strongly advocated what he terms the "combined treatment" for diseases of the eye. By this he means the administration of mercury and potassium iodide simultaneously with daily hypodermic injections of pilocarpine, so as to produce profuse sweating, the action of the remedies being, he claims, far more effectual when administered in this way. The treatment is especially advocated for severe cases of *irido-cyclitis* and *sympathetic ophthalmia*, the chief objection to it being that the pilocarpine injections are apt to produce profound depression. Russ Wood[5] has hit upon another method which he states is equally effective, while avoiding the depression consequent upon pilocarpine.

If, he says, a small quantity of guaiacol be smeared upon the skin, profuse diaphoresis results in about one hour. He has tried this method in about forty cases with most excellent results, *irido-cyclitis*, *vitreous opacities*, and *interstitial keratitis* seeming to be the most suitable conditions for the treatment. "The following is the routine usually employed: The urine is examined, and the mercury is omitted if any albumin is found. The ordinary alterative mixture of hydrarg. perchlorid. gr. $\frac{1}{10}$, and potas. iodid. gr. v is given thrice daily; sometimes, instead of the above, hydrarg. c. creta gr. i is given in a pill thrice daily, together with a mixture containing potassium iodide and tincture of nux vomica. The patient is kept in bed between blankets with two hot-water bottles, then 1 dr. of a mixture of equal parts of olive oil and guaiacol is smeared—not rubbed—either in the axilla or over the epigastrium. If this dose does not suffice then 2 dr. are used, and in rare cases 3, but mostly 1 dr. is enough. The part is covered with oil silk, and a pad of wool is applied over the silk. A hot drink is now given, and profuse general perspiration begins in from one to two hours, and lasts for about five hours. It is difficult to make some patients perspire, and in these cases a hot bath beforehand assists, and hastens diaphoresis. In one patient, some irritation of the skin was produced by the guaiacol, but this was practically well in a week on ceasing the treatment; but the skin in this case was too irritable to stand application on the same place two nights in succession. Generally twelve applications are made, then treatment is stopped for a few days, and begun again if considered necessary. As a rule, the patients are kept in bed the whole time, but occasionally when the applications are made in the morning, I allow them to sit up for an hour or so in the evening, well wrapped up."

Local Anæsthesia.—In spite of the numerous substitutes for cocaine that have been advocated of late years, there is no more generally useful local anæsthetic as far as the eye goes. If for any reason, however, a substitute is desired, the best is probably *novocain*. Le Brocq, experimenting for the Therapeutic Committee of the British Medical Association,[6] reports that its local anæsthetic power is about equal to that of cocaine, and its toxicity, as determined on frogs, mice, and rabbits, only about one-half that of cocaine. *Eucaine lactate* has a similar advantage over cocaine, but that drug has an irritant action when injected, which novocain has not. It is freely soluble in water, and can be sterilized.

Thiosinamine is a drug formed by warming oil of mustard with an alcoholic solution of ammonia, and used internally or subcutaneously with the object of promoting the absorption of pathological fibrous tissue. It is said to have been useful in treating cicatricial ectropion and post-neuritic atrophy of the optic nerve. Allied compounds recommended on account of their greater solubility are *fibrolysin* and *iodolysin*.

Fibrolysin is a combination of one molecule of thiosinamine with half a molecule of salicylate of sodium, easily soluble in water but

decomposing easily on being exposed to air and light. Its great use is to promote the absorption of cicatricial tissue. Grossmann[7] had a case of scald of the lids which resulted in their being so scarred that they failed to close properly, thereby causing an ulcer of the cornea. After the subcutaneous injection of 10 doses, at intervals of a few days—each dose except the first being of the full amount, which is put up in the glass capsules in which it is sold, namely, 2·3 cc. of a 15 per cent solution—a practical cure was effected. The drug has also been used to promote the absorption of corneal nebulæ, and here its employment in the form of drops applied locally is worth trying. It has certainly appeared to have a good effect in some cases recently seen.

REFERENCES.—[1]*Ophth. Rev.* 1899, p. 38 ; [2]*Ophthalmoscope*, 1908, p. 940 ; [3]*Ophth. Rev.* Mar. 1909 ; [4]*Ophthalmoscope*, Mar. 1909 ; [5]*Brit. Med. Jour.* July 24, 1909 ; [6]*Ibid.* Mar. 27, 1909 ; [7]*Lancet*, Jan. 16, 1909.

EYE MUSCLES, AFFECTIONS OF. *A. Hugh Thompson, M.D.*

Diagnosis of Ocular Paralysis.—In ocular paralysis or paresis, the defect of movement may be so slight as to be impossible to detect by ordinary inspection, in which case the diagnosis depends entirely on the diplopia, and the relative positions of the two images. It is a good plan to put a red glass before one eye so that one image may look red, and it is generally advised to use a candle as the test object, but the examiner's finger does really as well. If the paralysis is confined to a single muscle, and that muscle is either the internal or external rectus, there is seldom any difficulty about the diagnosis. When an elevator or depressor is affected, the diagnosis often needs the greatest care. We are of course very much helped or hindered by the intelligence or otherwise of the patient, and if we would avoid confusing both him and ourselves, it is essential to set to work systematically. The following rules (slightly modified from a scheme of diagnosis by Macnab[1]) will be found the best guide :—

1. *If the distance between the images increases as the patient looks in either direction, the diplopia is due to paralysis, and the direction in which it increases indicates the action of the paralyzed muscle.*

For instance, if the distance between the images increases most on looking to the left, the affected muscle must be either the left external rectus or the right internal rectus ; if on looking down, it must be one of the four depressors which act on the two eyes.

2. *The affected eye is always that which sees the image furthest in the direction in which they tend to separate.* If the diplopia increases most on looking down, and the red glass being in front of the right eye, the red image is lowest, it is a depressor of the right eye which is affected. So if the diplopia increases most on looking to the left, and the red glass being in front of the right eye the red image is most to the left, it is the right internal rectus which is affected.

So far the diagnosis is easy, and as far as the lateral muscles go these two rules are in themselves sufficient to make a diagnosis. But in the case of the vertically moving muscles we have to distinguish, between

the superior rectus and inferior oblique in upward diplopia; between the inferior rectus and superior oblique in downward diplopia. There are several possible methods of proceeding, but the most serviceable one is to determine the diagonal direction in which the vertical separation of the images is greatest. Suppose we have found that the affected muscle is a depressor of the right eye. We now slowly move the test object from the right-hand bottom corner of the patient's binocular field to the left-hand bottom corner, so that with his right eye he looks at first down and out and then down and in. The least intelligent patient will be able to tell us whether, as we do this, the red finger is getting more below the white finger or less so. Suppose then, that as the patient looks down and to the left the vertical separation of the two images increases; at this point we are very liable to make a mistake. The muscle which moves the right eye down and somewhat in, is the right inferior rectus. We are therefore apt to jump to the conclusion that it is the inferior rectus which is at fault. This, however, would be an error. When the eye is turned inwards the depressing action of the inferior rectus is at a disadvantage. It is when the eye is turned outwards that its depressing action is strongest. This will be understood by referring to *Fig.* 27, which shows the tendon of the inferior rectus to be directed somewhat outwards as it goes forwards to its insertion. Its depressing action is comparatively weak when the eye is turned inwards. In this position the eye is directed nearly in the line of the superior oblique tendon from the pulley to its insertion, and in this position it is the superior oblique which is the principal depressor of the eye. We conclude, therefore, that in the case just given, the paralyzed muscle is the right superior oblique. The third rule may be stated thus :—

3. *The vertical separation of the images is greatest when the eye is looking along the line of the tendon of the affected muscle.*

These three rules are the most important, and are in themselves sufficient for the diagnosis of a paralysis affecting any single muscle. Two others may be added which are necessary to a full understanding of the false images.

4. *The obliquity of the images relatively to each other increases as the eye is directed away from the line of the tendon of the paralyzed muscle.*

When the eye is either elevated or depressed, the rectus muscle tends to rotate it, not only on a horizontal axis, but also on an antero-posterior one in one direction, and the corresponding oblique muscle on the same axis in the opposite direction. Normally, therefore, these two actions neutralize one another; but in the absence of either, the other has its effect, which is to impart an obliquity to that axis of the eye which is normally vertical, and therefore to the false image. The obliquity of the false image, however, is in a contrary direction to the obliquity of the globe, i.e., it corresponds to the obliquity which the paralyzed muscle, acting by itself, would impart to the globe. In the case of the superior oblique, its action is to incline the upper end of the globe inwards towards the nose, and the false image caused by

its paralysis has its upper end inclined inwards as well. The power of the twist is in inverse ratio to that of the vertical component in the muscle's action. When the eye is directed inwards so as to be in a line with the tendon of the superior oblique, it acts as a simple depressor, the twisting component is nil, and the false image due to its paralysis is erect. When, on the other hand, the eye is directed outwards, the vertical component in the muscle's action is almost nil, the twist is at its maximum, and the false image due to its paralysis

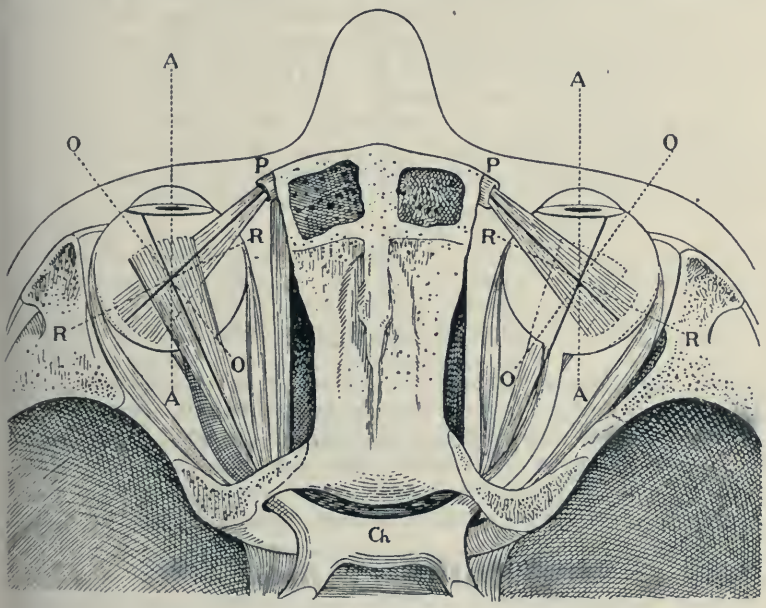

Fig. 27.—The Anatomy of the Ocular Muscles. **M**, centre of motion; **A A**, antero-posterior axis; **R R**, axis of rotation of superior and inferior recti, forming an angle of 63° with **A A**; **O O**, axis of rotation of superior and inferior oblique muscles, forming an angle of 39° with **A A** (the heavy lines, perpendicular to the axis of rotation, indicate the corresponding muscular planes); **P**, pulley (trochlea) of superior oblique muscle. The rectus superior of the right eye has been removed. The insertion of the inferior oblique is rarely visible from above; it can be seen better from the temporal side, **Ch**, chiasma. (From Norris and Oliver's *System of Diseases of the Eye.*)

is tilted most. In the case of the inferior rectus the converse of all the above is true. The obliquity of the image is always greatest when the vertical separation is least.

A fifth rule may be stated thus :—

5. *In paralysis of muscles turning the eye inwards, the diplopia is crossed, in that of outward moving muscles it is homonymous.* This is most evident in paralysis of the internal or external rectus, and the rule finds its most important application in these cases. In vertical paralysis it is typically true also. Thus, inferior rectus paralysis causes a crossed diplopia, superior oblique causes a homonymous one. The displacement of the images laterally, however, is but slight, and

may even be masked by a pre-existing want of balance between the internal and external recti, so that we do not rely on this rule in diagnosis of these cases.

To remind the reader of the anatomy of the ocular muscles a diagram is here reproduced from Norris and Oliver's text-book (*Fig.* 27). The chart (*Fig.* 28) gives the false images seen on looking down in paralysis

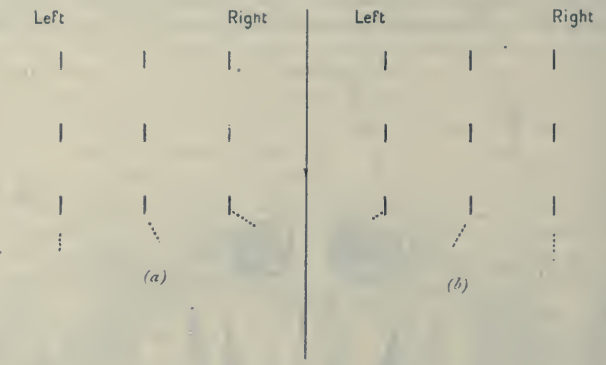

Fig. 28.—Paralysis of (*a*) Right superior oblique, and (*b*) right inferior rectus. The dotted lines show the false image.

of the right superior oblique and right inferior rectus respectively. The diagram (*Fig.* 29) is a useful one to bear in mind if it is understood. It indicates: (1) The direction in which the isolated action of any one muscle acting by itself would move the globe from a position of rest; (2) The obliquity which such action would give to the globe; (3) The position and obliquity of the false image relatively to the true

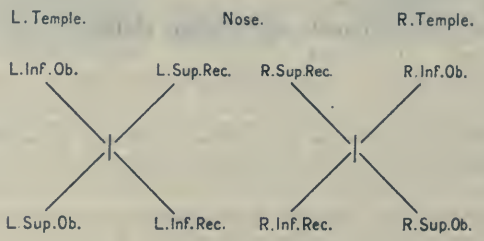

Fig. 29.

one caused by paralysis of any one muscle. Note that this diagram does *not* indicate the position of greatest vertical separation of the two images, which is wanted in our third rule of diagnosis, and though it indicates whether the diplopia is homonymous or crossed, and the direction of the obliquity, these points are often not easy to elicit. It is therefore necessary to supplement it in difficult cases by our third and fourth rules, which can only be fully grasped if we have in mind the anatomy of the muscles.

Treatment of Amblyopia in a Squinting Eye.—It is well known that the longer a concomitant squint in a child is left untreated the more difficult it is to obtain useful vision in the squinting eye. The main cause of the defect is now known to be a congenital absence, or at any rate weakness, of the fusion faculty by which the images formed on the retinæ of the two eyes are blended so as to form a single impression on consciousness. In the absence of this faculty there is often no sufficient stimulus to binocular fixation, and if one eye is relatively defective from a refractive error or from any other cause, the muscles guiding the weaker eye may give up the attempt. A squint is the result, and since in untreated hypermetropia the accommodation is never at rest, and there is a physiological connection between the two acts of convergence and accommodation, the squint in hypermetropia is almost always convergent. To avoid diplopia the patient very soon acquires the power of disregarding the image formed on the retina of the squinting eye. As time goes on, this disregard of the image involves a loss of the power to appreciate it at all distinctly.

Such is the now generally received theory of squint. In dealing with a case there are three points to consider: (1) The rectification of the position of the globe; (2) The development of fusion power; and (3) The possibility of improving the sight of an amblyopic eye. The first used to be the sole object thought about. It is now generally the last. The second may be successfully done in some cases, provided there is not a congenital incapacity to fuse. Anyhow, it needs a considerable amount of supervision on the part of the surgeon, and exercises with the amblyoscope. The third object is simpler, and may often be attained by simple methods. Its importance can hardly be over-rated. The methods in use are: (1) Occlusion of the good eye combined with proper refractive correction for the squinting one. This is a very effective method for young children. (2) Atropinization of the good eye. This is not so reliable a method as the first, as children will generally still continue to use the good eye exclusively, even though it is under atropine. (3) Systematic training of the amblyopic eye. A simple method is suggested by Alison Bradburne,[2] by means of a series of cards, on each of which letters are printed in two sizes, a large and a small size alternating. A card is chosen on which the amblyopic eye, having its refraction corrected, can see the large letters but not the small ones. The patient reads what he can with the good eye covered. On uncovering the good eye the intermediate letters become visible. Again, the good eye is covered and the bad one has another try, being helped this time by the memory of what the good eye has already seen. These exercises can be carried on at home, and when one card is mastered, another with smaller sized letters is substituted. In this way, combined with amblyoscopic exercises, it was found possible to develop the vision of a squinting eye in a boy of 11, the squint having existed since the age of 2. When first seen, the vision of the squinting eye was only $\frac{5}{60}$. After six months of exercises it

had risen to $\frac{5}{8}$. The boy, being exceptionally bright mentally, was peculiarly suitable for the treatment.

Paralysis of Ocular Muscles in Lead Poisoning.—Cases of optic neuritis due to lead poisoning may be associated with paralysis of one or more of the ocular muscles. To such cases Lockhart Gibson[3] applies the term "ocular neuritis." It appears that in Queensland such cases are not uncommon. They occur in fact at the rate of about four a year in Gibson's practice, and always in children. At first, a source of lead poisoning was looked for in the water, but the result being negative, the actual source appears to have been discovered in the paint used for garden railings and verandahs. This paint, after a year or two's exposure to the weather easily peels, and the children who are attacked are invariably found to be such as have had access to such railings, and when some children of a family are affected and not others, the affected ones are generally found to be those who bite their nails or suck their thumbs.

The muscles affected are generally the external recti, either one or both; the paralysis is accompanied by optic neuritis, generally with extreme swelling of the discs. The acute ocular cases are almost confined to children between the ages of 2 and 8. The poison appears to be a soluble carbonate of lead contained in the dry and peeling paint. Most of the cases occur in the summer months. The muscular paralysis is recovered from, but the optic neuritis may go on into atrophy leading to complete blindness. As the affection of vision does not begin before the atrophic stage, the occurrence of muscular paralysis may be fortunate in that it draws attention to the case, so that treatment is not too long delayed. This must consist in increasing doses of **Potassium Iodide.** (*See also* CONVULSIONS, INFANTILE.)

REFERENCES.—[1]*Lancet*, June 19, 1909; [2]*Brit. Med. Jour.* Jan. 2, 1909; [3]*Ibid.* Nov. 14, 1908.

EYELIDS, DISEASES OF THE. *A. Hugh Thompson, M.D.*

Ectropion and Entropion.—Ziegler[1] describes a method of dealing with both these conditions by the **Galvano-cautery,** which he has used with success in a series of cases which include senile ectropion, ectropion in connection with lacrymal obstruction, moderate cicatricial contraction, and spastic entropion. In the case of ectropion (*Fig.* 30) the everted lid is held in a clamp, and with the cautery, punctures are rapidly made in the conjunctival surface about 4 mm. from the free edge and about the same distance from each other. In the case of entropion (*Fig.* 31) the punctures are in a corresponding position on the skin surface. The procedure is not intended to replace a plastic operation in cicatricial contraction of high degree. In cases of trichiasis and entropion of the upper lid following trachoma—by far the commonest cases—it would generally be insufficient to relieve the condition, though Ziegler claims to have done so in one such case of fifteen years' standing. Like all other operations of this nature it

PLATE XXXVI

RHINOPLASTY AFTER LUPUS EXEDENS

Before treatment

Photo. by Dr. W. Kenneth Wills

PLATE XXXVII

RHINOPLASTY AFTER LUPUS EXEDENS

After treatment

Photo. by Dr. W. Kenneth Wills

may have to be repeated, but its comparative simplicity and the fact that it can be performed without a general anæsthetic are important recommendations.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* July 17, 1909.

Fig. 30.—Lid clamp adjusted to case of ectropion, showing row of galvano-cautery punctures on conjunctival surface.

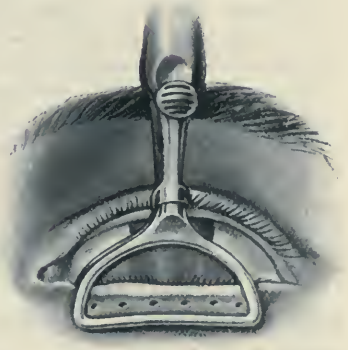

Fig. 31.—Lid clamp adjusted to case of entropion, showing row of galvano-cautery punctures on skin surface.

FACE, PLASTIC OPERATION AFTER LUPUS.

W. Kenneth Wills, M.A., M.B.
E. W. Hey Groves, M.S., F.R.C.S.

The patient whose photograph is shown in *Plates XXXVI* and *XXXVII* was a man aged 23, the subject of an extensive hypertrophic and hideously deforming lupus exedens, extending from the forehead to the sternum, and from ear to ear anteriorly. It had commenced in early childhood, and was still spreading when he first came under observation in 1903. He was in very indigent circumstances, and in his semi-starved condition radiant energy in several forms was tried unsuccessfully, but on his admission to the Workhouse Infirmary, with a more nourishing dietary, the X-ray treatment began to have a remarkable effect upon the disease. Much of the hypertrophic, pendulous masses shrivelled, and the ulcerations healed, while soon it was difficult to find any trace of active disease. At this time Mr. Hey Groves undertook to perform a rhinoplasty. The patient's face was much distorted by extensive scarring (*Plate XXXVI*). All the soft parts of the nose below the nasal bones had been lost. The lower lip was pendulous, and the facial aspect repulsive. On August

15th, 1908, rhinoplasty by the Indian method was performed. The skin over the nasal bones was turned down as a flap, with its base at the lower end of these structures and its raw surface outwards. A large flap was turned down from the forehead on the left side, and sewn to the face with its raw surface opposed to that of the first flap. The gap in the forehead was partly brought together by stitching, and the remainder closed by a Wolfe's graft from the deltoid region. Healing occurred satisfactorily except in the case of the forehead graft, which partly sloughed. A fortnight later, the base of the new nose was cut through and the twisted pedicle rectified. A piece was removed from the mucous surface of the lower lip to correct its redundancy. In November the lip was again operated on, this time by the removal of a wedge-shaped piece from the centre, including the whole thickness. At the present time the patient's condition is quite presentable; he can breathe through both nostrils, and the nose has a fairly natural appearance.

FACIAL HEMISPASM.

(*Vol.* 1909, *p.* 277)—This distressing malady has on several occasions been successfully treated by injection of an 80 per cent solution of **Alcohol** with 1 per cent of **Cocaine** into the trunk of the facial nerve at its point of exit from the stylomastoid foramen.

FACIAL PARALYSIS. (*See* PARALYSIS, FACIAL.)

FAVUS. *E. Graham Little, M.D., F.R.C.P.*

Persson[1] describes a remarkable cure of a case of very chronic favus of the body by means of **Inoculations** made from the patient's fungoid growth on the skin. The culture of the organism was obtained on a special medium (80 parts sterile sea water; 20 parts of a 5 per cent solution of nucleinic acid). The growth was complete in 72 hours. A dilution of this culture in physiological salt solution was used, a suspension of 5 million segments or spores to the cc. being obtained. This was sterilized, and a dose representing 500,000 of these was given daily for three days; two such doses on the fourth and fifth day; 2 million twice daily on the sixth day; 3 million twice daily on the 7th, 8th and 9th day.; 4 million twice daily on the tenth day; and 5 million twice a day from the tenth to the thirty-fifth day; from the thirty-fifth to the sixty-fifth day 2 million every alternate day. Seventy-seven injections were thus given, and the opsonic index, as represented in the chart, shows a progressive rise. The case was dismissed apparently cured, no recurrence having taken place six months later.

Lawrie[2] reports two cases of favus of the scalp in children which were apparently cured within a month by soaking the scalp for several minutes daily (after washing with soap and warm water and then drying) with crude **Petroleum,** gentle friction being used during the application and the patient wearing no dressing except a closely-fitting cotton cap.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* May 22, 1909; [2]*Brit. Med. Jour.* May 29, 1909.

FLAT-FOOT.

Priestley Leech, M.D., F.R.C.S.

Berry[1] recommends the use of the apparatus illustrated in *Figs.* 32–35 for night wear in cases of flat-foot. It seems likely to help in the treatment of this and allied conditions.

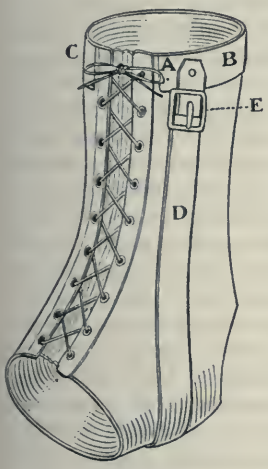

Fig. 32.

Fig. 32.—An ankle support of soft leather, cut away at the heel and laced up the front, with a band (*A*, *B*, *C*) of thin spring brass, leather covered, encircling the top of the support. A strip of thin spring brass (*D*), leather covered, is riveted to, and extends from, one end of the encircling band, down the side of the ankle, under the heel, and up the other side, fastening to the other end of the encircling band. A buckle (*E*) is riveted through the two pieces of brass and the ankle support.

Fig. 33.—A band to encircle the waist of the foot. For the adult foot this should be 1¼ in. wide. It is made to lace over the top of the foot. A strap (*D*) is riveted to the encircling band at *E*, corresponding to the inner and under surface of the foot.

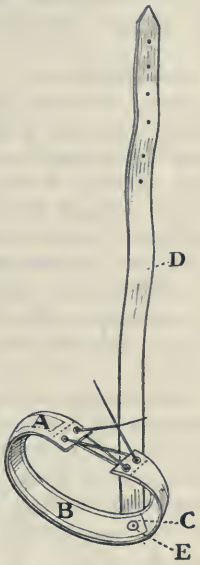

Fig. 33.

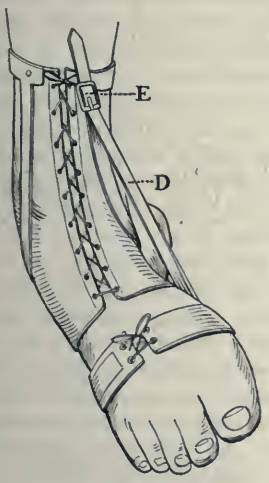

Fig. 34.

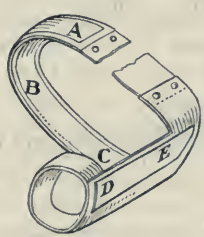

Fig. 35.

Fig. 35.—A modification of the waist band that can be used when hallux valgus is present. The band (*A*, *B*, *C*) around the waist of the foot is as in Figures 32 and 33, but there is a prolongation (*D*, *E*), to take the big toe. This prolongation is strengthened by a strip of spring brass, and corrective force can be brought to bear on the toe by bending this strip.

Fig. 34.—The strap (*D*) is to fasten into the buckle (*E*) of the ankle support, and, when tightened, draws the foot into a flexed and adducted position. In some cases it may be of advantage to incorporate a piece of elastic webbing into the strap. The strips of spring brass fastened to the apparatus by their leather covering serve to stiffen it, and cause the pull of the apparatus to be applied at the right points.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* May 15, 1909.

FOUL BREATH.

(*Vol.* 1909, *p.* 278)—Wylie insists upon the importance of discovering, and if possible removing, the cause, which is discussed in detail. Lozenges containing **Formic Aldehyde** are useful. In cases due to gingivitis, Lederer recommends the following mouth-wash: Thymol 0·25, Ol. Menth. Pip. 1·0, Acidi Benzoici 3·0, Tinct. Eucalypti 15·0, Alcohol 100·0. A teaspoonful in a glass of water four times daily.

FRACTURES. *Priestley Leech, M.D., F.R.C.S.*

For some time past there has been a good deal of discussion as to the advantages of **Operative and Non-operative Treatment** of fractures. and the amount of permanent disability that follows fractures of the various limbs. Those who contend that by no means a large percentage of fractures of the lower limb recover full wage-earning capacity, receive substantial support in an article by Clinton Dent[1] "On the After-effects of Injuries." [This article is well worth reading by all surgeons, especially those engaged in work under the Workmen's Compensation Act, as it deals also with the after-effects of head injuries, etc.]. His experience of the final result of fractures is drawn largely from a picked body of men—the Metropolitan Police. The gravity of simple fractures of the bones of the lower extremity is not adequately realized by those engaged in hospital practice. Even in the simplest fracture of the leg the period of disability is more prolonged, and the after-results in certain important respects much less favourable, than the majority seem to imagine, and there is an appreciable impairment of the wage-earning capacity. In the police, very complete recovery, not far short of a *restitutio ad integrum*, is necessary if they are to resume their occupation, and such a degree of recovery is seldom obtained. Slight shortening, or a very trifling degree of limping, which might escape notice in other walks of life, would be held to constitute disability. As regards treatment, early fixation in plaster for a period judged to be long enough to allow of sound union appears undoubtedly to delay adequate restoration of function longer than the other methods; the ultimate percentage of disability varies but little, whatever method of treatment has been employed. Judged by the standard required in the police, Dent says that he is keeping well within the mark when he says that at least 30 per cent fail to attain this standard after simple fracture of both bones of the leg; very few regain it under six months. Fracture of the leg involving the knee or ankle joints, or fractures of the femur, uniformly lead to permanent unfitness for the work that devolves on policemen; fractures occurring in the neighbourhood of these joints nearly always have the same result. He can hardly recall a case of Pott's fracture or a Dupuytren's fracture where recovery has been complete enough to enable a man to resume police work. As regards fractures of the patella, the results after operation are constantly all that could be wished; complete restoration of function and strength in a limb can generally be anticipated.

Arbuthnot Lane[2] maintains the correctness of his views as to the better results given by operation in many cases of fracture.

Warbasse,[3] of Brooklyn, thinks that non-union in the great majority

of cases is due to the interposition of a piece of muscle, periosteum, fascia, or blood-clot between the broken ends, and that constitutional weakness, old age, and lack of earthy salts in the blood have very little influence. He thinks the sooner a fracture is put up the better, and that less swelling will occur if this is done. In fractures of the thigh about the middle third the over-riding is considerable, and a good deal of force is often necessary to overcome it; often enough weight is not used for extension immediately after the accident. Every hour adds to the infiltration with serum, blood, and leucocytes of the connective tissue, fascia, and muscle about the fracture, and diminishes the elasticity of these tissues. What can be done by 20 lb. of traction in the first twelve hours cannot be done by 40 lb. after the third or fourth day. The X ray has shown that an accurate replacing of fragments is rare, but we must not forget that a perfect functional result is compatible with an imperfect piece of joining. The perfect reduction of long bones is difficult, and often impossible, without operation.

Fracture of Femur in the New-born.—In such cases, Isbister[4] recommends the splint shown in *Fig.* 36. The foot is not included in the splint, which only reaches to the tendo Achillis. A small, trough-shaped piece takes the calf, and the trough is continued up the back of the thigh (two-thirds of the way). A small bar clearing the buttock is attached at the upper end to a 2-in. loop surrounding the abdomen; the end of this loop or belt is fixed in a slot, so that the diameter can be readily altered. The whole is made of aluminium, and weighs unpadded $1\frac{3}{4}$ oz. The splint is best padded with a few layers of lint soaked in olive oil to prevent contamination. The child can be nursed in the usual way.

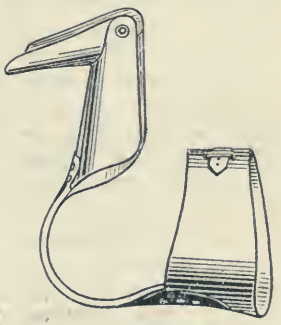

Fig. 36.—Splint for Fracture in the Newly-born.

Fractures of Femur.—Ashhurst and Newell,[5] of Philadelphia, think that the results of conservative treatment in these fractures are not so bad as many surgeons imagine. They have studied 121 recent cases which have been under treatment in the Episcopal Hospital during the last three years; they made no distinction between intra- and extra-capsular fractures. The mortality in 121 cases was 18·1 per cent: in fractures of the neck, 27·6 per cent; of the trochanter, no deaths; of the shaft, 15·6 per cent; of the condyles, 5·5 per cent. With the exception of those of the neck, there was only one fracture in which, on discharge, firm bony union had not taken place. The treatment has been various, no two surgeons using the same method. The functional end results are classified under the following headings: (1) Perfect functional result, which, without regard to shortening, implies the entire absence of limp and of any hindrance to the normal use of

the limb; in this class are 28 cases out of 61 traced. (2) No disability but limp, 21 cases out of 61. (3) Marked impairment of function: the limp was decided, and in some cases the use of a cane, and in a few the use of a crutch, was still necessary, although even these patients were by no means helpless. In this class were 8 out of 61 traced. (4) Incapacitated: the patient has to use two crutches, or is confined to the house. In this class were 4 out of 61. Forty-one patients were measured, and eight, or about one-fifth, recovered without shortening; 32, or 78 per cent, had less than one inch shortening; none of the patients had more than two inches shortening, and none of those with fractures of the shaft itself had more than three-fourths of an inch. They doubt whether the results of operation would be any better.

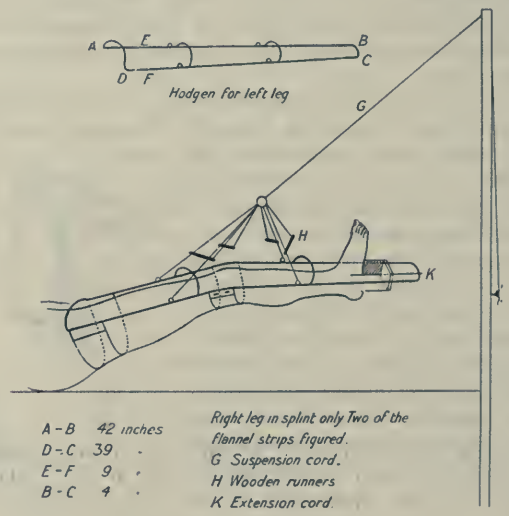

Fig. 37.—Hodgen's Splint.

Robinson[6] recommends the use of **Hodgen's Splint** in private practice for the treatment of fractures of the femur; three kinds of injury are, however, not suited to the treatment by this splint, viz., fracture complicated by any injury to the leg which prevents the application of a strapping extension; separation of the lower epiphysis, which requires complete flexion for its reduction; and fractures of the femur in children too young to lie still. An advantage is that it can easily be made and is easily sterilized. In order to make the splint take 9 ft. of fencing wire, ¼ in. thick, for the framework, and a few feet of wire half that thickness for the arches, two in number, and so placed that they divide the splint into three equal parts. Wire loops should be soldered to the frame an inch above each arch. The dimensions are given in *Fig.* 37. To apply the splint, a stirrup of strapping is fixed

below the knee, and a piece of wood 3 in. square is fixed in its centre. A cord *K* is passed through the wood and fastened to the wire midway between *B* and *C*, so that when the splint is laid upon the leg with the cord *K* taut, *A* lies on the anterior superior spine and *D* lies above the tendon of the adductor longus. The frame is now bent to the degree of flexion of the knee which is most comfortable for the patient, quite irrespective of the position of the fragment, which is adjusted later. Strips of flannel are now fastened along the inner limb of the splint by one end and then passed under the leg, the other end being fastened by pins to the outer limb, adjusting them roughly at first to form an even trough for the leg to lie in. Cords are now tied to each loop on the frame, and a small wooden runner 2 in. long is threaded on each. The free end of each cord is passed through a curtain ring, then through the other hole in the runner, and a knot tied. At the foot of the bed an upright pole is fixed, having a notch cut in its top, which should be 7 feet from the floor ; a cord *G* is fastened to the curtain ring passed over the top of the pole, and by pulling on this the leg is raised about 10 in. from the bed, and the cord made fast to the bedstead. The flannel strips are now adjusted more accurately, and the splint more bent or straightened, as the case may be, to bring the axis of the lower fragment exactly into line with the upper: here an anæsthetic may be required. Each of the four short cords can easily be adjusted by means of the runners, and should there be any tendency for these to slip, a pin, passed through the cord above, will prevent it. The foot of the bed should be raised on blocks 6 in. high, and care taken that the end of the splint swings free of ironwork and post. The weight of the limb is the extending force, and the little piece of cord beyond the stirrup is the index of efficient working: it should be always taut. It is important that the patient must not be allowed to slide down to the foot of the bed, and the top end of the splint must ride free of the groin ; the wire of the splint should not touch the patient at any point ; the top edge of the flannel should fit accurately into the gluteal fold, and care be taken lest the strips slip down the wire framework. When all the strips are adjusted they should be sewn on to the splint with thread and the pins removed. The only disadvantages are that the strapping may slip and require renewing, and the leg in winter may not be very warm ; but this can be avoided by cotton-wool.

Hogarth Pringle[7] recommends the use of the **Permanent Extension Method** in fractures ; it gets rid of effusion, allows early movement, and permits the nutrition of the tissues to be maintained ; while it does more than massage can ever do, because by its use shortening is overcome to a remarkable extent, and the time during which the patient is under treatment is also shortened. During the last twelve months he has treated twelve cases of fracture of the shaft of the femur in which, though the average shortening at the time of admission was 2 cm., at the time of dismissal it was only 0·5 cm.—a result that is very much better than is obtained either by splinting or massage. Bardenheuer

claims to have had very good results from this method. In the method as practised by him and Pringle, the strapping in fractures of either the leg or the thigh reaches from the perineal groove on the inner side of the limb to a similar level on the outer aspect, leaving a loop below the foot to which the extending cord is applied. In this way a pull

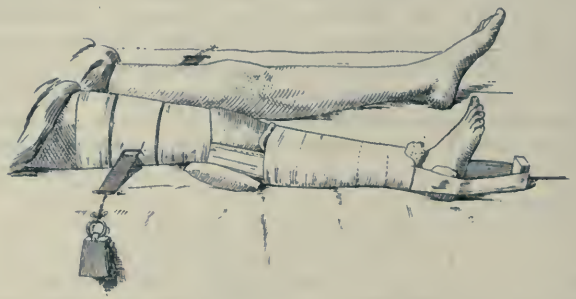

Fig. 38.—Fracture of middle of shaft of femur in extension. Note the gauze pads at malleolus and along crest of tibia under the extension straps; the double-acting transverse pulls at site of fracture; the pad under the knee.

is obtained on skin, fasciæ and muscles, throughout the whole length of the limb. Good adhesive and non-irritating plaster spread on strong canvas is used, and is fixed to the limb (which must be shaved) by circular strips of adhesive plaster on cambric applied in an imbricating

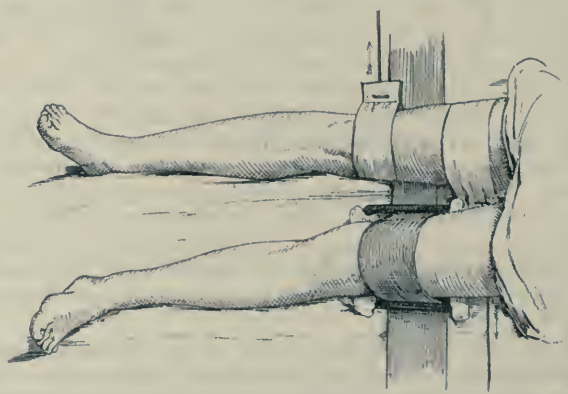

Fig. 39.—To illustrate action of two transverse pulls on right femur acting so as to drag the upper end of lower fragment inwards. On left femur a backward-acting pull.

manner one above the other; beginning below just above the ankle, they extend as far as the tibial tubercle. The knee joint is left uncovered by the circular strips, to permit of movements being carried out, but the strips are commenced again one inch above the level of the upper border of the patella, and continued up the thigh as far as

possible. The skin over the malleoli and the shin border of the tibia are protected from the pressure of the straps by folds of gauze. A pad is placed beneath the knee to maintain a very slight degree of flexion, and a weight, anything up to 35 lb., is applied to the longitudinal straps. When the shortening of the limb is reduced or got rid of, any lateral displacement of the fragments is to be counteracted by secondary transverse pulls; these are applied by taking a piece of broad adhesive plaster spread on canvas, and encircling the limb with it, leaving one end longer than the other. The short end is sewn to the other opposite the centre of the lateral aspect of the limb (in the inner or outer aspect as the case may be), so as to make a loop which fits the limb quite closely but not too tightly, and to the long free end of the plaster a weight is attached by a cord. Backward and rotating displacement can be rectified in the same way. Weights of 2 to 6 lb. are applied to the side pulls. Instead of strapping, he has lately been using straps of strong swansdown applied to the limb by means of a mixture of Venetian turpentine 1 part, rectified spirit 2 parts, as recommended by Professor Heussner; this is put on by means of a brush; the straps are then simply fastened to the limb with a gauze bandage; with this the limb does not require to be shaved, and the long strips are more quickly applied.

Fractures of the Neck of the Femur in Early Life.—Royal Whitman[8] draws attention to the difference between fracture of the neck and epiphyseal disjunction of the neck of the femur. An injury to the hip in a healthy subject resulting in immediate disability, and presenting the physical signs of fracture, whether in childhood or adolescence, is far more likely to be a fracture of the neck than at the epiphyseal junction. In the first ten years of life the injury is almost certainly at the neck; in adolescence it is probably at this point. If, on the other hand, the subject is an adolescent, particularly of the weak, rapidly growing, or over-weighted type; if the symptoms were produced by comparatively slight injury; if the disability was not complete but slowly progressive;—the probability is that the lesion is an incomplete epiphyseal fracture. In fractures of the neck, if the fracture has been seen before consolidation is advanced, place the limb in complete abduction. In the epiphyseal type, operation may be called for to relieve pain, check the progression of the deformity, and restore function.

Strain Fractures of the Knee.—Lange,[9] of Cincinnati, draws attention to fractures of the knee due to strain on the ligaments. He gives notes of four such cases which have come under his notice as radiographer. In one the external lateral ligament was put on the stretch, and caused a tearing off of its tibial attachment, the external tuberosity of the tibia. In the second case the strain was exerted chiefly upon the internal lateral ligament, and resulted in a tearing off of its tibial attachment, the internal tuberosity of the tibia, and also in loosening a small fragment at the site of its femoral attachment, the internal condyle of the femur. In the third case the strain was borne chiefly by the crucial ligaments,

resulting in an avulsion of the tibial spines at their base. In the fourth the strain was apparently felt by the internal lateral ligament, which resulted in a tearing off of its femoral attachment, the internal condyle of the femur. This giving way of the internal lateral ligament apparently put the crucial ligaments on the stretch, as evidenced by the avulsion of their tibial attachment (the tibial spine). Well-executed skiagrams may render possible an accurate diagnosis of conditions that are too often vaguely termed "internal derangements of the knee joint."

The Olecranon.—Corner[10] gives notes and skiagrams of some interesting cases of fractured olecranon. These fractures are not uncommonly overlooked, the swelling hiding them, and the subsequent pain and bruising need not be great, while loss of power may only be temporary. The physical signs are few, may easily be overlooked, and the patient is so slow in regaining power in his arm that he is regarded in the light of a malingerer. There may be only a line of tenderness transversely across the olecranon ; a very small gap between the fragments, and perhaps some slight tilting of the upper fragment. In fact a skiagram is often the only positive evidence of the fracture. They are caused by direct violence. The obliquity of the line of fracture is always downwards and backwards, and the line of fracture is about the level of the head of the radius and intra-articular. These cases are best treated by a **Sling** and **Massage,** and later by **Passive Movements.** Usually neither direct nor indirect splinting is required, as an excellent result is easily obtained. Sometimes the patients continue working without any evil results, but in others permanent damage is done, as in a case quoted, where the skin broke over the fracture and a septic sinus leading into the joint resulted. With regard to the subsequent use of the limb, there is no difference between fibrous and bony union, but the olecranon must be mobile on the humerus ; if its movements are restricted the result is not good. As regards internal splinting, screws are not so good as wire, and all internal splints become loose owing to absorption of bone round them. **Operation** is indicated in the majority of cases, especially where there is wide separation of the fragments, or later if there is imperfect mobility of the olecranon.

Separation of Upper Mandible.—Bligh[11] reports two cases of this accident. The separation in both took place at the junctions of the malar processes of the superior maxillæ with the maxillary borders of the malar bones, and at the articulations of the nasal processes of the superior maxillæ with the frontal bones, so that the upper mandible, carrying the nasal bones with it, hinged upon the root of the nose just below the glabella. He thinks steadying of the fracture unnecessary, as one case recovered without.

(*For* "after-results," *see* JOINTS, RESULT OF INJURIES TO.)

REFERENCES.—[1]*Clin. Jour.* Oct. 7, 1908 ; [2]*Pract.* Feb. 1909 ; [3]*Jour. Amer. Med. Assoc.* Mar. 13, 1909 ; [4]*Brit. Med. Jour.* Apr. 17, 1909 ; [5]*Ann. Surg.* Nov. 1908 ; [6]*Pract.* Mar. 1909 ; [7]*Ibid.* Aug. 1909 ; [8]*Med. Rec.* Jan. 2, 1909 ; [9]*Ann. Surg.* July, 1908 ; [10]*Lancet,* Jan. 23, 1909 ; [11]*Ibid.* Mar. 18, 1909.

FUNICULITIS, TROPICAL ENDEMIC. *J. W. W. Stephens, M.D.*

D. K. Coutts[1] describes five cases of this affection occurring in Egypt, where it is a rare disease—less than 1 in 10,000 cases. It occurs in young adults. Non-suppurative thrombosis of the pampiniform plexus is not uncommon in Egypt. The author believes that all stages occur between this and the suppurative form in question. All the cases gave a history of urethritis, a practically universal condition in Egyptian adults. The author believes that a diplococcus is the cause, the vas deferens in these cases being lined with granulation tissue.

PATHOLOGY.—The testis and epididymis are not involved. Above, the vas and vessels are surrounded by a dense elastic mass of tissue, containing suppurative foci and islets of fat.

TREATMENT.—The affected tissues are either completely removed, or incised and fomented.

REFERENCE.—[1]*Lancet*, Jan. 28, 1909.

FURUNCULOSIS. (*See* BOILS.)

GALL-STONES. *Robert Hutchison, M.D.*

According to French writers[1] there are three factors in the production of gall-stones: (1) Constitutional predisposition ("simple family cholæmia"); (2) Biliary stagnation; (3) Infection of the bile passages. In prophylactic treatment the first of these can be counteracted by a **Lacto-vegetarian Diet** containing a moderate amount of the white meats, but from which alcohol and spices are excluded. Biliary stagnation can be avoided to some extent by the use of a "rational" corset. They have not much faith in "cholagogues," and do not believe that infection can be prevented by the use of antiseptics. When gall-stones are actually present treatment must be directed either to their elimination or to the production of a condition of "tolerance" on the part of the gall-bladder. The first indication is met by ordering large and increasing doses of **Olive Oil** (25 up to 200 cc., at intervals of two to five days, taken fasting); **Glycerin, Durand's Drops,** or **Benzoate of Soda.** Also by the use of large cold enemata and "hydro-mineral cures." Tolerance on the part of the gall-bladder should be aimed at when there is "vesicular colic" indicating the presence of a large concretion which one cannot hope to see expelled. It is favoured by rest in bed and a skim-milk diet. They consider that cholelithiasis is essentially a benign condition, and that operative treatment is but seldom indicated.

Senator[2] considers that **Soap,** owing to its fatty acids, is an important cholagogue. He uses it in the form of sapo medicatus, which is a combination of soda with oleic acid and small quantities of margarinic acid. It is neutral in reaction. He gives it in pill form.

℞ Sapo Medicat. gr. 150, 180 or 225 | Mucilag. q.s. ut fiant 100 pil.
Three pills to be taken after food three times daily.

The action of the soap is aided by the injection of high enemata

of olive oil and soap and water. He also speaks highly of **Ovogal,** which is a recently introduced albuminate of bile acids.

Kehr[3] regards operation as imperative in all cases of acute or chronic empyema of the gall-bladder, in chronic obstruction of the bile-duct, and in cases where repeated attacks of colic are rendering life unendurable. In uncomplicated or latent cases he only advises operation when there are indications of involvement of the pancreas as well (positive pancreatic reaction, etc.). He does not consider that the remote chance of latent gall-stones leading to the development of carcinoma justifies operation. His mortality in operation on uncomplicated cases (cholecystectomy with or without drainage of the common duct) is between 2 and 3 per cent.

REFERENCES.—[1]*Sem. Méd.* Sept. 9, 1908; [2]*Folia Therap.* July, 1908; [3]*Münch. med. Woch.* No. 21, May 25, 1909.

GALL-STONES, SURGICAL TREATMENT.

Rutherford Morison, F.R.C.S.

The facts that gall-stones are a serious possession, that their early recognition is of importance, that operation is the only satisfactory form of treatment, and that the dangers of operation are the dangers of delay, are receiving increasing recognition. It is possible that gall-stones, like foreign bodies elsewhere, may lie quiet for an unlimited time, and that they only cause serious trouble when infection of the gall-bladder supervenes. Cholecystitis plus gall-stones stimulate the gall-bladder to violent expulsive efforts, and these forcible unstriated muscle contractions are the cause of gall-stone colic. If the expulsive efforts are unsuccessful in extruding the stones, exhaustion of the muscular coat ensues and the attack ceases; but recurrence is to be expected, as it is unlikely that the cholecystitis will disappear till the stones have been removed. The diagnosis of gall-stones has often to be made in the absence of physical signs, from a history only of these recurring attacks; hence the study of them is one of great importance. By patients they are generally described as "spasms," and associated with the stomach and indigestion. The characteristic pain comes on so suddenly that it is often compared with a stab, and generally reaches a violence sufficient to make the patient shout out or groan. Vomiting frequently follows, soon after the commencement of the pain, but if it gives any relief this is likely to be temporary. During the attack, to draw a long breath is frequently impossible, and inspiration is apt to be suddenly arrested. A rigor sometimes occurs, and, if it does, strengthens the diagnosis. Like other pains due to the contractions of unstriated muscle, this one is apt to awaken patients from their early sleep. In from one to six hours it passes off, leaving the patient but little the worse, and with no symptoms till its return. On examination during the attack, it is frequently possible to feel the enlarged, tender gall-bladder, and for some days after a spot at the outer edge of the rectus muscle opposite to the tip of the 9th costal cartilage remains tender on deep pressure.

If the gall-bladder succeeds in driving a calculus into its neck or into the cystic duct, and blocking its outlet, the pain will not entirely disappear, but will be replaced after many hours of acute suffering by a continuous aching. Physical examination will show then, or later, an enlarged gall-bladder. Subsequent happenings will depend chiefly upon the virulence of the gall-bladder infection.

If the inflammation is of a severe type, the gall-bladder quickly becomes distended and so tense that gangrene of its walls may occur in the course of a few hours. The patient is very ill, suffering from all the symptoms of an acute toxæmia, and unless quickly relieved by operation will soon die (acute phlegmonous cholecystitis).

If the infection is less severe, the gall-bladder swelling continues to be tender on palpation, there may be some elevation of temperature and night sweats, and the gall-bladder is distended by purulent contents and surrounded by adherent coils of intestine and omentum (empyema of the gall-bladder).

If the infection has been of a sufficiently mild nature to be overcome by the walls and secretions of the gall-bladder, the swelling is not tender, may remain unaltered for many months, causes no constitutional disturbance, and, when its contents are examined, beyond the stone or stones only clear mucus is found (hydrops of the gall-bladder).

Between these three types there is no hard and fast line.

The diagnosis of gall-stones in the gall-bladder dictates the treatment. The stones should be removed without delay. To postpone operation is a surgical offence. The operation is now safe, and there is a certainty of removing all the stones, a chance that may not be offered again.

When stones are passed into the duodenum through the ducts there is a history of similar painful attacks, but they are associated with shivering and more serious vomiting, and are followed by jaundice. If stones can be found in the fæces, the diagnosis is certain. If the stone is arrested in the common duct, jaundice persists for a longer time and may never entirely disappear, though it ebbs and flows. A small stone will temporarily cause occlusion of the duct; a large one will not block it permanently. The reason is that the common duct, like other muscular tubes in the body, grips, by spasm, a foreign body entering it, but after a time it dilates and recedes from the foreign body, so that the common bile-duct may reach such a size as to look like the duodenum. This explains the intermittent jaundice of an impacted stone, and also explains how a large stone may be found in the common duct with no jaundice. As a rule, the contractions of the duct are not so painful as those of the gall-bladder, and after a stone or stones have escaped from the gall-bladder into the common duct, the pains are likely to become less violent unless other stones still remain in the gall-bladder.

The condition of the gall-bladder may be of considerable diagnostic importance, and requires consideration. After a series of attacks its walls become thickened and its cavity small, just as happens to any other hollow muscular viscus in the presence of an intermittent

obstruction. During delayed gall-stone operations, it is usually found buried in adhesions, thick-walled and contracted as the result of obstruction to its outlet and inflammation of its walls. This condition of the gall-bladder serves as a useful guide to the operator, who recognizes in it an assurance that the diagnosis of gall-stones is correct. On this knowledge is based the well-known belief that jaundice accompanied by a tumour of the gall-bladder is not due to gall-stones. An illness which has *as a start* sudden severe pain, and which has been followed by jaundice, is unlikely to be due to anything but gall-stones, though every persistent jaundice, if there are no painful attacks, is still apt to be put down to " cancer of the liver."

The prognosis of gall-stone cases is one of the most uncertain in medicine. From apparently the most hopeless and prolonged illnesses patients may recover; but not seldom in others, when convalescence seems well advanced, there is a sudden bad turn and the patient dies. That cancer of the gall-bladder and liver follows the prolonged irritation of gall-stones in a considerable percentage of cases is now common knowledge.

The prognosis after operation depends upon so many other conditions than the presence of gall-stones alone that it has to be made for each individual case. One general law, however, can be confidently offered: when the stones are limited to the gall-bladder and cystic duct, all of them can be removed with certainty and with a minimum of risk; but when stones have passed through the cystic into other ducts, no operator, however skilful, can give an assurance that all have been removed, and the risk of the operation is seriously increased.

It is interesting to note what enormous importance operators attach now to drainage of the gall-bladder and of the ducts. It should be suggestive that the strongest arguments against lithotrity thirty years ago for stone in the bladder were based upon the impossibility of drainage to cure the accompanying cystitis, and that during the last ten years drainage of the peritoneum and of wounds following operations has been found to be less necessary and increasingly undesirable.

B. G. A. Moynihan[1] says that the inaugural symptoms of gall-stones are referred to the stomach, and are described as " indigestion." The pain is not acute, but is rather a sense of fullness, flatulence, oppression, or distention in the epigastrium. It comes usually half or three-quarters of an hour after food, especially of certain kinds, and is relieved by belching, and especially by vomiting. It is occasionally severe, and goes through to the shoulders, particularly to the right shoulder. In taking a breath, as the chest fills a sudden stabbing pain is felt which cuts short the inspiratory effort. This spasm of the diaphragm may serve to distinguish gall-bladder from gastric or duodenal conditions. A slight shiver towards evening, accompanied by a sensation of weight and fullness in the head, of drowsiness, or of a dull, heavy headache, is often noted. These are the symptoms of gall-stones, and he believes that they are never present in the gall-bladder without giving rise to symptoms. The text-book symptoms are nothing but the clinical

expression of the later complications of the disease. He has unexpectedly found gall-stones many times during operations. In every such case he has elicited a history of their presence, and their removal has cured long-standing complaints.

Hugh M. Rigby,[2] in a review of forty-six consecutive cases operated upon for cholecystitis, says with two exceptions gall-stones were found in the gall-bladder or bile-ducts. In 50 per cent acute infection had occurred and the gall-bladder was suppurating. It occurred in 5 females to 1 male, and no less than 7 were under thirty years of age. When stones were present in the gall-bladder and cystic duct, the symptoms were, recurring attacks of pain referred to the gall-bladder region, sometimes with slight transient jaundice, or pain and discomfort in the epigastrium after food, with occasional attacks of nausea and vomiting, or a continuous " dull ache " which may radiate to either shoulder, front of the thorax, and region of either breast. Stones may be present in the gall-bladder for long periods, and give rise to no symptoms which may suggest their presence. Acute infection of the gall-bladder gives rise to the symptoms of peritonitis, generally limited to the right upper quadrant of the abdomen, the diaphragmatic movements are impeded, giving rise to " jerky " and painful respirations. Jaundice was absent in the majority of all the cases.

If a swollen gall-bladder is present, the diagnosis is less difficult; if the gall-bladder is much thickened from long-standing irritation by stones and acute infection occurs, dilatation does not follow and a tumour is absent. In these cases a rigid rectus muscle on the right side, hyperalgesia of the skin over the gall-bladder region, and Murphy's sign are generally present.

In three cases suppuration was found in a thickened gall-bladder containing stones, and the temperature had remained normal throughout the illness.

Gall-stones and cancer are difficult of diagnosis—indeed, they may be combined, but absence of nodulation of the liver and of ascites are hopeful signs. If there is doubt, an exploratory operation should be performed.

Rigby gives the following—

Table of Conclusions.

Condition.	*Treatment.*
1. Gall-stones are present in the gall-bladder only, associated with acute cholecystitis. The gall-bladder is acutely inflamed, but no marked distention, and no gross change in its wall.	Removal of the stones, with drainage of the gall-bladder.
2. Gall-stones are present in the gall-bladder, with acute cholecystitis. The wall of the gall-bladder is so affected that abscess, sloughing, or gangrene has occurred. No symptoms of cholangitis are present.	Remove the stones and the gall-bladder. Ligate the cystic duct, after examination of the common duct. Provide drainage.

TABLE OF CONCLUSIONS—*continued.*

Condition.	*Treatment.*
3. Stones are found in the gall-bladder, with impaction of a stone at its neck. There is much distention or alteration in the wall of the gall-bladder. Symptoms of cholangitis are absent.	Remove the gall-bladder and stones. Ligate the cystic duct.
4. Stones are present in the gall-bladder and the cystic duct. There is no marked alteration in the wall of the gall-bladder other than acute inflamation.	If possible remove stones and drain gall-bladder.
5. Stones are present in the gall-bladder and cystic duct. There is much distention or alteration of the wall of the gall-bladder.	Remove the gall-bladder and ligate the cystic duct, in the absence of cholangitis and implication of the common duct.
6. If stones are impacted in cystic duct and cannot be removed.	Remove the gall-bladder, ligate the cystic duct.
7. The gall-bladder is much thickened, contracted, and adherent, and contains stones without acute infection.	Drainage with removal of stones. If impossible, remove the gall-bladder and stones, and ligate the cystic duct.
8. The gall-bladder is much thickened, contracted, and adherent, and contains stones *plus* suppuration.	If possible, drain the gall-bladder after removing the stones. If impossible, remove the gall-bladder, and drain through the cystic or common ducts.
9. Stones are present in the common duct.	Remove the stones and drain the common duct. Drain the gall-bladder, if necessary, but do not remove it.
10. Growths of the gall-bladder.	Cholecystectomy whenever possible.

John B. Deaver[3] says, "The larger one's experience in gall-stone disease the less able is he to state whether gall-stones are, or are not, associated with cholecystitis." The severity of the cholecystitis is indicated by the general symptoms, and varies with the virulence of the infection. It may be so mild as to require only medical measures, such as the **Carlsbad Cure,** for its treatment, but when there are frequent relapses, and when discomfort persists in the intervals, operation is demanded to obtain a cure. A more serious attack ends in suppuration and acute purulent cystitis, which should be treated by **Cholecystostomy** and the removal of any obstruction. If the infection is still more virulent, phlegmonous inflammation and ulcerative and gangrenous cholecystitis develop. If unchecked by surgical means, the infection may spread along the ducts into the liver and produce infective cholangitis, which is recognized by the ague-like attacks produced by it. The result of the infection of the liver may be abscess, and, if recovery follows, cirrhosis.

In addition to spreading by continuity, the gall-bladder infection may spread by contiguity and involve the neighbouring peritoneum. This involvement may lead to adhesions, abscess, or diffuse peritonitis.

Mayo Robson,[4] in a lecture on fistula between the stomach and bile-passages, with remarks on other internal biliary fistulæ, says:—Though these may result from malignant growths and ulceration of the stomach, duodenum, or colon, and hydatid disease, gall-stones are the most frequent cause. If the fistula is direct, it is due for the most part to ulceration spreading from the gall-bladder or ducts which have become adherent to a neighbouring viscus. In some cases it effects a cure by allowing the gall-stones to escape, although these may cause secondary troubles. It is probable that many heal, and a diagnosis is never made. In some, the fistula gives relief of all symptoms so long as it is patent, but its subsequent closure may occasion return of the attacks. Though the fistula may form quietly and without serious disturbance of health, it is frequently attended by the symptoms and signs of infection of the right upper abdomen, and, if the ulceration extends to the stomach, hæmatemesis. If the fistula leads into the stomach, gall-stones may be vomited, if into the duodenum (the most common variety), intestinal obstruction may follow impaction of the gall-stone, and this rarely occurs if the fistula leads into the colon. In separating adhesions, if a small fistulous opening is missed, the result may be peritonitis and death. In operations on the biliary passages, the use of silk is dangerous, as the bile usually contains septic organisms which infect the silk and cause trouble, sometimes serious. The intestinal canal is not the only part, though the most common, in which these fistulæ are found. They occur less often between the urinary tract and the bile-passages, between the gall-bladder and pregnant uterus, between the bile-passages and vagina, between the common or hepatic duct and the portal vein, between cavities in the liver and pancreas and bile-passages, pericardium, pleura, and lungs.

In another paper Mayo Robson[5] says it is now generally recognized that jaundice is in the majority of cases due to mechanical obstruction. If the obstruction is in the common duct, **Cholecystenterostomy** will relieve the jaundice and may cure the cause. The operation should not be employed when the block is due to stones in the common duct, as these can be removed, and is specially called for in two classes of cases only: (1) Simple obstruction of the common duct by the presence of an inflamed or cirrhosed head of pancreas; (2) Obstruction due to growth in the duct or pressure on it by cancer of the head of the pancreas. In deeply jaundiced cases, a decision concerning operation is of great importance, as chronic jaundice frequently indicates malignant disease, and not only do patients with cancer bear operations badly, but when jaundice is associated with it there is the same tendency to persistent oozing of blood from the wound after operation as there is to spontaneous hæmorrhage when no operative measures have been undertaken. Diagnosis is therefore all important.

With *gall-stones in the common duct* the jaundice is of varying intensity, deepening after each paroxysm; there are ague-like attacks, with chill, sweating, and fever, followed by deeper jaundice, and at the time of the paroxysm, pains in the region of the liver, with epigastric disturbance. This illness has often been preceded by a history of long-standing spasms without jaundice.

In pancreatitis the gall-bladder is often enlarged, the stools are bulky, pale, and greasy, and there is a tendency to looseness; the area of tenderness is over the pancreas, which may be felt to be enlarged, and the pain is referred to the left or to the midscapular region. Fat in the stools, and the pancreatic reaction in the urine, are important diagnostic points.

In cancer of the head of the pancreas, the jaundice is preceded by failing health in patients usually over fifty, and comes on painlessly. The gall-bladder is enlarged and not tender. A hard, nodular tumour may be felt at its inner side. There is extremely rapid loss of weight and strength, with increasing anæmia and "black jaundice." In jaundice cases from cancer of the head of the pancreas, examination of the fæces will show an absence of stercobilin; in pancreatitis and common-duct stones there is usually some present.

A characteristic "pancreatic" reaction in the urine, examination of the fæces, and a carefully taken clinical history will often make a differential diagnosis between chronic pancreatitis and malignant pancreas possible. In all cases still doubtful during operation, cholecystenterostomy should be performed. The indications for the operation are: (1) In jaundice due to interstitial pancreatitis; (2) In biliary fistula dependent on stricture or other permanent occlusion of the common bile-duct; (3) In jaundice due to stricture or tumour of the common bile-duct; and (4) In jaundice dependent on cancer of the head of the pancreas (?). The contraindications are: (1) In any obstruction of the bile-duct, such as gall-stones, which can be removed with a reasonable prospect of success, and (2) In contracted gall-bladder, in which the operation is impracticable.

Gaskoin Wright[6] reports a case illustrating the value of **Turpentine** in gall-stone operations. The patient was a woman, about 54 years of age. Cholecystostomy was performed, and the gall-bladder, which was full of stones, was cleared out. A large mass of impacted stones was found lying apparently in the ductus choledochus, but, on account of the adhesions round the gall-bladder, etc., the duct could not be properly exposed. A piece of indiarubber tubing was fixed on a small glass syringe and 1 dr. of turpentine injected through the cystic duct on to the surface of the impaction. In a few minutes he was able to break up the impaction, and in about ten minutes all the stones were removed from the duct. The patient made an uninterrupted recovery, the opening in the gall-bladder healing up in about six weeks.

Kehr[7] states that there are three main questions to discuss: (1) The case in which operation is indicated; (2) What intervention is preferable for calculi in the gall-bladder—cholecystendysis, cholecystostomy,

or cholecystectomy? (3) For calculi in the common duct—choledocotomy, for re-union, or drainage of the hepatic duct? He concludes in regard to (1) that there is a great tendency to latency of disease (80 per cent). Of 4,000 cases, more than 2,700 were considered by him as most suitable for medical treatment. Some grave complication should be present in order to determine operative interference. In respect to (2) and (3) Kehr's results are as follows: 295 operations of conservative character on the gall-bladder and cystic duct (cholecystendysis, cholecystostomy, cysticotomy), 6 deaths (2 per cent); 303 cholecystectomies, 11 deaths (3·6 per cent); 293 choledochotomies, 12 deaths (4·1 per cent); 224 combined operations for non-malignant complications, 36 deaths (16 per cent).

Prof. Alessandri's[8] indication for urgent interference is empyema of the gall-bladder owing to the danger of rupture. In uncomplicated gall-stones medical means may be tried. If the latter class of case comes to the surgeon, he prefers cholecystectomy to cholecystostomy.

D'Urso advises operation, because the statistics in uncomplicated cases are so good, and because some patients, who from necessity cannot be under direct surgical supervision, die from gangrenous cholecystitis.

Margarucci has come to the conclusion that in any case of gall-stones which is not simple, cholecystectomy should be done, as this is the surer treatment. The adhesions present indicate an infection, and this results in the formation of further gall-stones.

De Paoli mentions the scarcity of operations for gall-stones in Italy, and says he has found that the frequency of gall-stones found at autopsies is much less in Italy than in foreign lands. He condemns medical treatment, and considers it should be spread broadcast that gall-stones are fairly often associated with cancer of the gall-bladder, especially in women. He considers that a mere suspicion of the presence of gall-stones is sufficient justification for an exploration.

References.—[1]*Pract.* Dec. 1908; [2]*Ibid*; [3]*Amer. Jour. Med. Sci.* Nov. 1908; [4]*Brit. Med. Jour.* May 1, 1909; [5]*Lancet*, Feb. 6, 1909; [6]*Brit. Med. Jour.* Dec. 10, 1908; [7]*Sem. Méd.* Oct. 7, 1908; [8]*Il Policl.* Nov. 7, 1908.

GASTRIC ULCER. (*See* Stomach.)

GLANDERS. *E. W. Goodall, M.D.*

A case of chronic glanders has been reported by Addison and Hett,[1] chiefly for the purpose of showing the difficulty there is in distinguishing certain forms of the disease from tertiary syphilis.

The patient, a carman, who had been driving a horse said to have been destroyed because affected with glanders, was first taken ill in August, 1907, with violent cramps in the legs, pains in the back and limbs, and severe headache. An abscess developed on the back of the left forearm, but cultures made from the pus were sterile. The illness was diagnosed as influenza. In January, 1908, the patient again came under observation; he was found to have faucial ulceration, which was believed to be of syphilitic origin. He was treated

accordingly, but without benefit. He came under the notice of one of the authors on August 8th, 1908. It was found that he was affected with most extensive ulceration of the palate and pharynx. The tonsils, uvula, and soft palate had quite disappeared, with the exception of a part of the anterior pillar and a small piece of the tonsil on the left side. The ulceration had begun to spread to the alveolar border of the lower jaw on the right side, and to the cheek. On the remains of the soft palate were two small ulcers. The edges of the ulcerated parts were undermined, with very little evidence of inflammation. The floor was covered with sticky muco-pus. The posterior pharyngeal wall was covered with scar tissue. Rhinoscopy revealed swelling and inflammation of the nasal passages, but no ulceration. The larynx was normal. There was no glandular enlargement. On account of the history and the failure by antisyphilitic treatment, the case was diagnosed as one of chronic glanders. But bacteriological examinations failed to reveal the bacillus of glanders, though a Gram-negative organism which was obtained gave rise to orchitis when injected intraperitoneally into a male guinea-pig.

The patient remained under observation till the date of the writing of the account from which this abstract has been made. Briefly it may be stated that in spite of treatment the ulceration continued to spread, so that the hard palate, both sides of the lower jaw, the septum nasi, and inferior turbinate were involved. In August, 1909, the glanders bacillus was definitely isolated from an abscess which had formed on the patient's face.

In making the diagnosis of glanders in ulceration such as has been described in this case the following points are important: (1) The occupation of the patient, which brings him into contact with horses; (2) The history of an origin in a definite febrile attack of doubtful nature, in which subcutaneous and intramuscular abscesses appeared; (3) The type of ulceration. With respect to this the authors write as follows: "In a considerable proportion of the cases where palatal ulceration is found, it is quite indistinguishable from that of tertiary syphilis, but in some cases, of which our own is an example, the process seems to be much more one of simple melting away of the tissues than of granuloma formation with subsequent necrosis, such as occurs in gummata." (4) The temperature nearly always varies two or three degrees during the day. (5) There are no signs of syphilis, such as interstitial keratitis or periosteal nodes. (6) The disease fails to improve under antisyphilitic remedies. (7) Usually, careful bacteriological examination will reveal the causal organism. (8) Wassermann's reaction is negative.

Chronic glanders is infectious; the authors refer to a case reported by Batko, in which a man affected by the disease infected his wife and two children, who all died. A useful bibliography is appended to the paper. Sadly enough, in the same number of the *Lancet* which contains the paper which has been abstracted above, appears an account of the last illness and death of Dr. J. H. Wells, who fell a

victim to glanders contracted while engaged in bacteriological research. In his case the illness lasted for about 18 months. It was not until he had been ill for some weeks that definite localizing symptoms became manifest, the first of them being a swelling deep in the calf of the leg. Vaccine treatment with a vaccine prepared from the *Bacillus mallei* apparently afforded relief at first, but after a few months the disease returned with increased intensity.

REFERENCE.—[1]*Lancet*, Oct. 23, 1909.

GLANDS, TUBERCULOUS. *Priestley Leech, M.D., F.R.C.S.*

Pirie[1] draws attention to the conflicting reports as to the efficacy of the **X Rays** in the treatment of tuberculous glands, and thinks that the divergent opinions may be explained by the successful cases having had a sufficient and the unsuccessful ones an insufficient dose. An efficient dose may raise the opsonic index from below normal to normal, and may kill giant cells which are forming. Giant cells are quickly growing cells at one time in their history, and they contain tubercle bacilli which, being thus enclosed, are protected against leucocytes. The X rays destroy the giant cells soon after their formation, and thus prevent them protecting the bacilli. It is therefore imperative to get the case early, while the glands are growing larger, before they have begun to grow fluid, and to give a sufficient dose of X rays once a week, to kill the week's crop of giant cells before reaching maturity. Pirie now treats his gland cases for a prolonged period once a week with the maximum dose that the skin will stand. This is one-third of an epilation dose, which just causes the hairs to fall out of a child's scalp. He measures this by means of Sabouraud's method, and confirms this measurement by means of his water meter. It is as important to measure X rays as it is to measure drugs.

Most,[2] of Breslau, says that infection of the cervical glands by tuberculosis comes next in frequency to that of the lungs. He thinks the infection rarely comes from the blood, but generally travels from above downwards, the upper cervical glands being first affected; in rare cases, however, the supraclavicular glands may be first affected from the tracheobronchial glands. He thinks that in children tubercle bacilli can penetrate the mucous membrane without leaving any trace or lesion at the point of entry. Infection from the skin of the head and neck, from the alveolus or dental caries, or from the mucous membrane of the mouth, is seldom tuberculous, more often pyogenic. He believes that the throat ring (tonsils, lingual muscles, etc.) is the most frequent point of entrance of the tubercle bacillus. In children, the bovine type of bacillus is mostly found, and is due to infection by milk. In older people and in phthisical families, infection by the human bacillus is frequent. If the usual hygienic means do not lead to a cure or resorption of the glands, operation should be undertaken, but this should be a radical one, and the original sources of infection must be treated.

Ritchie[3] had been struck with the different accounts given of the

results of the treatment of tuberculous glands by means of **Tuberculin**, and he has noticed the different results given by the same treatment in different patients. It appeared to him that if the patients were infected with the bovine type of the bacillus they would not react to tuberculin (Koch's R.), which is prepared from bacilli of the human type. Where unexpected relapses in the course of treatment with human tuberculin had occurred in his earlier cases, it has been found that the initial diagnostic test to the human bacillary type had been negative, and regarded merely as a technical error, whereas subsequent examination when carried out has shown the case to be really one of bovine infection.

As a preliminary to a satisfactory course of specific inoculation treatment, diagnostic tests as to the type of bacillus to which the infection is due should be made. Three of these diagnostic tests are available: (1) The inoculation test devised by Struthers Stewart; (2) The absorption test; (3) The comparative index test. The latter has largely occupied Ritchie's attention. It is based on a considerable number of operations, which have shown that, as against the same control, the phagocytic index of an infected person to serum is the same within limits of technical error to all organisms other than the one with which he is infected. The index to that organism usually stands at a distinctly different level, whether higher or lower. It may on occasion happen to approach the same level if fluctuating, but this is in his experience a rare eventuality. Instead of testing with a number of organisms, one may greatly simplify matters by testing with one indifferent organism, that is to say, with which one may be certain the patient is not infected. This furnishes us with the patient's standard index, and it is compared with the indices to organisms suspected as the cause of infection. In tuberculous cases Ritchie would then test the patient's indices to avian, bovine, and human tubercle bacilli. The index to the avian bacillus gives the standard, and one may expect one of the other indices to correspond; the remaining variable index points to the type of infection. He thinks these tests furnish us with a means of diagnosis with a view to inoculation treatment in cases of tuberculous glands in the neck. To see whether clinical differences were present, he has collected notes of 37 cases, of which 22 were judged to be types of human infection and 15 of bovine infection. From this he concludes that the bovine type is rare after maturity, and on the whole is more characteristically an infection of youth than is the human type; bone and lung affections represent the bulk of the complications of the human type; glandular, skin, and eye affections those of the bovine type. More of the bovine cases of gland infection gave a history of over one year's duration, and this corresponds with the impression Ritchie has gained that the bovine type of surgical tubercle tends to be of a slow chronic character, often intractably persistent, while the human type is frequently associated with the more acute forms of disease; but this is by no means exclusively the case.

In Ritchie's opinion the most suitable form of tuberculin is Koch's R. tuberculin, which can now be obtained commercially made from either human or bovine types of bacilli as may be desired. He recommends diluting the tuberculin as sent out with 0·9 per cent sterilized saline. Glycerin should not be used. This mixture is placed in small sterilized flasks fitted with rubber stoppers; a few drops of chloroform are added, and renewed as evaporation takes place. The chloroform, on being shaken up, partly passes into the solution, and serves to maintain the sterility of the fluid indefinitely. For the comfort of the patient it is desirable to inject the smallest quantity of the fluid that can be accurately measured in the syringe. The injections should be made with a syringe accurately marked, which can be sterilized by boiling, and is fitted with thin 1-inch platinum needles. As accuracy of dosage is of such great importance, it is desirable to work with the metric system and to use a syringe marked in divisions of 1 cc.; syringes made abroad and marked in minim measure are frequently very inaccurate. The injection should be made directly into a muscle (triceps in its lower fourth and gluteus in children are suitable). The more acute and active the disease, the smaller the dose; the smaller the dose, the shorter is the duration of its action. Nothing is to be gained in the end by an attempt at rapid immunization. The initial doses should be given at comparatively short intervals, to avoid the production of a condition of hyper-susceptibility. For the same reason no dose should be smaller than any preceding one. If a dose given is thought to be too large, it should not be diminished, but a longer interval should be allowed to elapse before the next is given. On the other hand, it is probably not necessary to increase a suitable dose to any extent.

As the condition becomes quiescent and passes under control, the interval may be lengthened and the dose slightly increased. The ideal dosage is one which, without causing any obvious reaction, produces the most prolonged effect. In an adult, in a case of chronic tuberculous glands of the neck, one would commence with a dose of ·001 mgram of the appropriate tuberculin; repeat the same dose in two weeks, and then in three weeks, and then at successive intervals of four weeks. After at least six months had elapsed, if the case had progressed satisfactorily, one might extend the interval to five or six weeks and increase the dose by a quarter or a half to ·00125 or ·0015 mgram, and continue with this to the end of the treatment. Under these circumstances there is no necessity for giving the patient a "rest" from the inoculations. The course will show steady and slow improvement, without any effects being directly noticeable from the injections. If the condition is active or progressive, such a dosage may give rise to an increase of inflammation at the site of the disease: if a gland is already breaking down, the liquefaction may be augmented by collection of serum, and the abscess point more rapidly at the surface. In these cases one must proceed more cautiously, and the initial dose be but half or a quarter of that

first mentioned; the second dose is given after a week or ten days, the subsequent doses at an interval of three weeks, and if progress is satisfactory, these doses are increased until after perhaps two or three months' treatment the dosage is as for the quiescent condition given at first. These doses are for an adult; for people under twenty, three-quarters of the above dose, half if under fourteen years old, and so on. An infant would get one-tenth or one-twelfth. The doses are based on the original and correct calculation of Koch's tuberculin R. as sent out, containing the active properties of 10 mgrams weight of bacteria per cc. If liquefaction takes place, remove by a trocar or drain unless the skin is involved, in which case surgical measures must be considered to avoid ulceration and disfigurement; and inoculation against pyogenic organisms may be necessary.

Operative measures can be combined with the tuberculin treatment, but with regard to operations in tubercle there are two features to which special attention should be drawn: (1) Tubercle infection may be more widely distributed through a patient's body than is evident on the surface or discoverable by means at our command; (2) Operation in a tuberculous area may lead to a dissemination of the bacteria to other parts of the body, and may also lead to fresh local infection. Ritchie recommends, unless abscess formation also exists, that operative procedures should be deferred until tuberculin treatment had been undergone; for this a six months' course is necessary, as one or two injections are insufficient to protect against extension after operation.

Willie Meyer[1] recommends the use of **Bier's Elastic Bandage** round the neck, and if an abscess forms, open it and use suction; this gives rise to very little scarring, but of course will not be successful in every case.

REFERENCES.—[1]*Med. Press*, Apr. 7, 1909; [2]*Berl. klin. Woch.* No. 3, Jan. 18, 1909; [3]*Med. Press*, Mar. 24, 1909; [4]*Med. Rec.* Nov. 21, 1909.

GLAUCOMA. *A. Hugh Thompson, M.D.*

EARLY DIAGNOSIS.—In the absence of any constant increase of tension or of typical cupping of the disc, the diagnosis of early cases of chronic glaucoma must depend mainly on the visual field. Typically this is diminished peripherally, and more especially in the lower and inner quadrant. When, however, this defect is unmistakable, the disease is no longer incipient. It was the Danish professor Bjerrum who first discovered about twenty years ago another defect in the field which can almost always be verified in the incipient stage. This is an enlargement of the blind spot and its extension in the form of a narrow crescentic band of scotoma either above or below the central fixation point. To demonstrate it, the 10 mm. test object of the ordinary perimeter is too large. Bjerrum employs a black screen two metres square, 6 metres distant from the patient to be tested, and with a test object not larger than 6 mm. This gives a visual angle of only 10 minutes, and with this there is a reduction of the normal peripheral field; but it is only the central part of the field

which has to be tested, and the blind spot is found to be enlarged only in cases of glaucoma. It is now stated by Rönne,[1] Prof. Bjerrum's assistant, that in 87 cases in which ordinary perimetry showed nothing abnormal, a distinct enlargement of the blind spot was detected by Bjerrum's method in 51, and that all these cases proved to be glaucoma. The diagrams show the difference between the field of vision tested in the ordinary way, and by Bjerrum's method, the half-shaded portions being found normal by the former but defective by the latter method. *Fig.* 40 shows an extension of the blind spot below the fixation point which is typical of early glaucoma. *Fig.* 41 shows an extension of this defect at a later stage, when the peripheral defect is already well marked. The two are seen to have met.

Fig. 40.

Fig. 41.

No one who has tried Bjerrum's method has disputed the accuracy of his observations, but the unwieldiness of the large screen has prevented many from employing it, except, I believe, in the Edinburgh school. A few years ago Priestley Smith[2] urged the importance of the subject, and pointed out that, if sufficiently small test objects were employed, the large screen is not really necessary. He has devised a simple form of scotometer, or those who possess McHardy's perimeter can use it with a 1 or 2 mm. test object (cf. *Medical Annual* for 1908.) The best plan is to explore different circles by rotating the test object instead of merely exploring the various meridians as is usually done. With such small test objects, however, it is essential that the patient should keep his eye fixed, and it is not always easy to be sure that he is continuously fixing the central point of the screen, as he should do: this difficulty applies to all the forms of perimeter or scotometer hitherto invented. It has been overcome by Bardsley,[3] whose scotometer is in the form of the section of a hollow sphere with a small hole in the centre of the fixation disc, through which the surgeon can look, and assure himself of the direction of his patient's gaze in a way which is otherwise impossible. This instrument should render service not only in glaucoma but in all diseases where the accurate mapping out of the visual field is important.

Hæmorrhagic Glaucoma.—This term is used to signify either (1) cases of primary glaucoma in which retinal hæmorrhages occur in the course of the disease, or (2) cases in which the hæmorrhages are primary and the glaucoma secondary. In no case can the prognosis as to sight be good, but it is not so bad in the first class as in the second. In all cases except those in which enucleation is indicated, an attempt to bring down the tension gradually should first be made by such measures as purgatives, leeching, miotics, and rest in bed. Iridectomy is to a certain extent dangerous, as the sudden diminution of tension may cause a renewal of the hæmorrhage. In cases of primary glaucoma, however, after the preliminary measures have had their effect, which will generally be in from twelve to twenty-four hours, it should be performed. In cases of secondary glaucoma of this sort, which usually occur in patients of between 50 and 70 who are affected with general arteriosclerosis, Stedman Ball[4] recommends a careful **Paracentesis** of the aqueous, taking care that it is evacuated slowly drop by drop, and in addition **Leeching** of the temple, the use of **Eserine** ¼ per cent and **Pilocarpine** 1 per cent drops in combination every hour, with hot applications to the eye in the intervals. At the same time appropriate means must be taken to lower the general blood-pressure. An acute attack can generally be relieved by some such means, but the only way to guard against a relapse is to counteract the inevitable tendency of high blood-pressure by non-stimulating diet, purgatives, etc. The paracentesis may of course have to be repeated. In the discussion following this paper, Verhoeff remarked that in most fatal cases the post-mortem examination proves that both the retinal hæmorrhages and the glaucoma have a common cause, viz., obstruction of the central vein by endophlebitis. This condition would of course make restoration of sight hopeless.

Primary Glaucoma in Young Patients.—Cases of typical primary glaucoma are not often seen in patients below the age of 40, but they do occur. Four cases that I have seen and described[5] have presented the following features. They all ran a chronic course, with or without subacute exacerbations but without much pain. Cupping of the disc was a well-marked feature except in the early stage. Shallowness of the anterior chamber was absent. This effect of the operative treatment was on the whole good in tending to arrest the disease. The youngest patient seen with typical glaucoma was 15.

Cyclodialysis.—This operation, less radical than iridectomy but easier to perform in difficult cases, has been devised either to supplement it when the tension remains high after iridectomy, or as an alternative operation when iridectomy is contraindicated. It was first advocated in 1905 by Heine, of Breslau, and a description of it will be found in Meller's Ophthalmic Surgery.* The object is to establish an artificial connection between the anterior chamber and the suprachoroidal space, to effect which it is necessary to break through the fibres known

* Blakiston's Son & Co., Philadelphia, 1908.

as the "ligamentum pectinatum," which connect the ciliary body with the sclero-corneal junction. Since it is the sclerosis of these fibres which, according to the theory of Thomson Henderson, is the essential cause of glaucoma, the procedure is not without theoretical justification. The operation is thus performed: A conjunctival flap having been made with scissors, preferably down and out from the corneal margin, a narrow incision is made into the sclera at a point from 6 to 8 mm. from the corneal margin with a lance knife. The incision must be made principally with the edges of the knife, so that it may be of uniform width, and the operator must be specially careful not to go too deep with the point, in which case the ciliary body would be wounded and hæmorrhage might be troublesome. Any hæmorrhage from the small scleral veins is easily controlled by adrenalin drops. The width of the incision must be just enough to introduce a spatula such as is used for the reposition of the iris in cataract operations. The spatula is inserted between the sclera and ciliary body, and gently pushed upwards by small lateral movements until its end is seen in the angle of the anterior chamber. In so doing it will have separated the fibres of the ligamentum pectinatum, but it should not do any violence to the ciliary body itself. The spatula is then withdrawn, during which process the aqueous humour may or may not be allowed to escape, according as it is desired to diminish the tension immediately or (as in hæmorrhagic glaucoma) only gradually.

Arnold Knapp[6] has performed the operation in 18 cases, and concludes that it is of value in certain limited conditions, especially in advanced cases of chronic glaucoma in which iridectomy has not succeeded in bringing down the tension. In 11 out of 15 cases of this sort, the tension was reduced by cyclodialysis for observation periods varying between two months and two years and nine months. The operation has also been performed for acute and secondary glaucoma. In cases where the anterior chamber is very shallow, it is easier than iridectomy, and may be performed as a preliminary to that measure. It is not suggested that in ordinary cases of glaucoma, whether acute or chronic, the new procedure should supersede iridectomy.

REFERENCES.—[1]*Klin. Monats. f. Augenh.* Jan. 1909, in *Ophth. Rev.* Feb. 1909; [2]*Trans. Ophth. Soc.* 1906; [3]*Ibid.* 1908, p. 98; [4]*Jour. Amer. Med. Assoc.* July 24, 1909; [5]*Ophth. Rev.* June, 1909; [6]*Jour. Amer. Med. Assoc.* Sept. 1909.

GONORRHŒA. *C. F. Marshall, M.Sc., M.D., F.R.C.S.*

In an article on the incidence of gonorrhœa in gynæcological practice, Frances Ivens[1] says truly that it is "remarkable that a disease so widely spread in the community and disastrous in its effects upon the female pelvic organs, should have been treated with less attention than the more rare gynæcological cases. Cases may be regarded as simple leucorrhœa, cystitis, or pelvic inflammation, unless a searching enquiry is made into their etiology. It follows that the lay public is entirely unaware of the lifelong suffering and

chronic ill-health caused to thousands of women annually by this infection. Otherwise it is inexplicable that while attention is concentrated on the falling birth-rate, no one should have brought forward gonorrhœa as the most frequent cause of sterility. Women are not infrequently blamed as unnatural creatures, losing the maternal instinct in the present-day struggle for ease and pleasure, when they are the victims of a preventable disease. The chief danger of gonorrhœa lies in its chronicity, as cases are multiplied by those who believe themselves to be cured." Ivens gives the results of her observations at the Stanley Hospital, Liverpool, comprising 1052 out-patients and 157 in-patients. Diagnosis was based on a history of pelvic inflammation following the first menstruation after marriage, associated with dysuria, sterility, and, when there were children, with ophthalmia neonatorum. In many cases the clinical diagnosis was confirmed by bacteriological examination of the discharge from the urethra, cervix, Bartholin's ducts, or the contents of pelvic abscesses. In acute cases the diagnosis is easy; in latent cases it is difficult when the gonococcus cannot be found.

Bilateral inflammation of Bartholin's ducts, acuminate condylomata on the vulva, a caruncular condition of the urethra, assist the diagnosis. In acute cases there may be œdema of the cervical mucous membrane, causing a polypoid appearance. This may be followed by erosion of the cervix and a greenish vaginal discharge. At the menopause there is sometimes vaginitis. When the disease has spread to the endometrium or tubes, the uterus may be tender and enlarged, or an inflammatory mass may be felt in Douglas' pouch. Obscure cases of cystitis are often of gonorrhœal origin. Menstruation is usually increased in frequency and duration when the endometrium is affected. A mucopurulent discharge without menorrhagia indicates endocervicitis. Menstruation is often followed by an increase in the the discharge, when the gonococcus can be more easily found. Latent cases may become acute after extreme exertion or exposure, and during pregnancy and the puerperium, from any cause producing pelvic congestion, from attempts to replace a fixed retroverted uterus, from pessary treatment or curettage. Ivens found gonorrhœa in 14 per cent of 1052 consecutive gynæcological out-patients. Nearly all the patients with gonorrhœa were married women; 30 per cent were sterile, while many had only one child. Among the 157 in-patients 39 were gonorrhœal and 13 sterile. Of these 39 cases 5 required operation for purulent salpingitis, 2 for pyosalpinx, and 2 for ovarian abscess. In 2 there was a hæmatoma of the ovary, and in 1 hæmatosalpinx. In 18 there was chronic salpingitis, including 3 cases of hydrosalpinx. Most of these cases required laparotomy, 7 cases only of chronic endocervicitis being treated by curettage. According to Ivens, curettage should be limited to cases of endocervicitis where the disease has not spread beyond the internal os.

As regards prognosis, Ivens states that in pelvic cases complete recovery without a mutilating operation is uncommon, even after

prolonged rest. Conservative preservation of the tubes often ends in a second operation, but the occasional success of such procedure is an encouragement to refrain from severe measures. Re-infection often spoils the treatment. " In a mild case the prognosis is difficult. The disease may subside, to light up again after extra exertion, or during menstruation or pregnancy. In many cases the patient becomes the subject of chronic pelvic pain, which takes her from one hospital to another. The physical signs are so slight that she is often regarded as the victim of neurosis, and it is only on opening the abdomen that one finds justification for her complaints. In such cases operative measures are often quite successful, and, freed from the chronic pain, the nervous system may return to a normal condition."

TREATMENT was carried out as follows. In chronic cystitis **Silver Nitrate** was applied through a Kelly's speculum, and followed by **Boracic Lotion** irrigation. Cases of acute salpingitis were treated by rest in bed, milk diet, saline aperients, and turpentine stupes. If pus was suspected the abdomen was opened. In all but one case one ovary at least was left. In some cases an inflamed corpus luteum containing pus was excised by a wedge-shaped incision. Relapses after expectant treatment were common, necessitating operation. In two cases the uterus was removed with the tubes ; the after result in these cases was better than when the uterus was left, when leucorrhœa often persisted.

TREATMENT IN THE MALE.—Pedersen[2] classifies the methods of treatment of acute gonorrhœa in the male as follows : (1) *The expectant method ;* (2) *The modified expectant method ;* (3) *The hand injection method ;* (4) *The irrigation method.*

1. *The expectant method* places the patient under the best possible conditions for allowing the disease to run its normal course of from five to six weeks. It comprises absolute **Rest in Bed,** milk diet, one or two quarts of plain or slightly alkaline water a day, mild laxatives, abstention from alcohol, coffee and tobacco. This method, although rational, is obviously impracticable in most cases.

2. *The modified expectant method* includes drugs for three purposes : (*a*) To influence the amount and the reaction of the urine ; (*b*) To render the urine more or less antiseptic ; (*c*) To charge the urine with a medicament which acts on the inflamed mucous membrane. For the first purpose there are the demulcents and alkalies, **Sodium Benzoate, Sodium Salicylate, Salol,** and **Saccharin.** For the second purpose there are urinary antiseptics such as **Urotropin, Cystogen, Lysidin,** and **Helmitol.** For the third, the balsams, **Copaiba, Santal Oil,** and **Cubebs.**

3. *The injection method* directly attacks the gonococcus at the site of its invasion and development. The drugs recommended for this purpose are the new silver compounds—**Argonin, Protargol, Albargin, Argyrol,** and **Novargan.** According to Pedersen, the injection of 2 drachms of a solution of one of these silver compounds, and its retention for five to ten minutes, in the earliest stage of gonorrhœal urethritis, will abort the acute stage and shorten the subsequent course of the

disease, unless a complicating sequel of antecedent urethritis is present.

4. In Pedersen's opinion, the *irrigation method* is not so rational as the hand injection, unless the medicament used be a silver albuminoid compound in weak solution, and the irrigation be given so gently as not to damage the acutely inflamed urethra by overdistention, nor force the fluid past the sphincter into the bladder. He considers that intravesical irrigation in acute urethritis is irrational and contraindicated, as it causes hyperæmia of the mucous membrane of the posterior urethra, which invites infection, and may lead to urethrocystitis and epididymitis. On the other hand, he recommends irrigation of the anterior urethra in conjunction with hand injections of one of the silver compounds in neglected cases in which the inflammatory symptoms are severe, as shown by a red and œdematous meatus and a copious greenish discharge. The irrigations should be discontinued as soon as these symptoms have disappeared.

Pedersen formulates the indications for treatment as follows: (1) *Destruction of the gonococcus* without increasing the damage done to the mucous membrane; (2) *Termination of the inflammatory process* excited by and left behind by the gonococcus; (3) *Repair of the damaged mucous membrane.*

1. The first indication is fulfilled by the new **Silver Compounds,** which kill the gonococcus without increasing the inflammation. These may be given by hand injection every three hours for the first day, and every four hours afterwards, the injections being retained for five to ten minutes. As the gonococci begin to disappear, the strength of the solution is diminished and the frequency of the injections is reduced to twice daily. After the gonococci have been absent three to seven days (depending on the severity of the case), the injections are reduced to once daily. From five to ten days later they are discontinued altogether. If the inflammation is very acute, the anterior urethra should be flushed with a solution of 1–30,000 perchloride of mercury before each injection of silver.

2. The second indication is met by the mineral or vegetable astringents, such as **Zinc Sulphate** 2 gr., **Zinc Sulphocarbolate** 5 gr., **Zinc Chloride** or **Iodide** ½ gr. to the ounce. These are injected twice daily until the discharge has ceased. If the catarrhal discharge persists longer than two weeks in a case of average severity, some complication should be looked for, and if gonococci reappear the silver injections should be resumed.

3. Repair of the mucous membrane is best carried out by **Silver Nitrate,** 1–5000 to 1–250, applied by an Ultzman's syringe, or urethroscope, in solutions of 5 to 10 gr. to the ounce. This instrumentation should not be oftener than once a week, and the lubricant used should be soluble in water. When the morning drop persists, owing to follicular urethritis, irrigation of the anterior and posterior urethra with 1-30,000 perchloride, 1–2000 permanganate, or 1 per cent solution of one of the silver compounds is useful.

According to Pedersen, posterior urethritis occurs in 90 per cent

of all cases, usually about the eleventh day, and in most cases causes no symptoms. In the treatment of *acute posterior urethritis*, so long as tenesmus is not severe, the modified expectant treatment is sufficient—rest in bed, milk diet, Vichy water, saline aperients, and balsams. When tenesmus is unbearable, instrumental treatment is indicated. The anterior urethra having been irrigated with warm boric lotion and anæsthetized with 2 per cent eucaine, a soft rubber catheter is passed and the posterior urethra is gently flushed with 2 or 3 dr. of one of the silver solutions, or a solution of silver nitrate, 1–5000 to 1–1000. One such instillation may be sufficient to relieve the tenesmus.

Christian[3] is of opinion that, while the duration of gonorrhœa has not materialy diminished in recent years, the suffering and discomfort have been lessened both by reason of our increased knowledge of the pathology of the disease and by the introduction of improved methods of treatment. We have a clearer conception of the way it should be treated, but the day of ultimate cure seems as remote as ever. Christian has tried every line of treatment devised and suggested by enthusiastic advocates from time to time, the result being a plan of treatment not very original, but fairly satisfactory to the patient. The **New Silver Compounds** seem to offer a reasonable chance of aborting the disease, if employed early enough, without causing the urethral irritation produced by nitrate of silver. He points out that solutions of the new silver preparations (protargol, novargan, argyrol, etc.) must be freshly prepared to be at all effective, as they have little effect when over seventy-two hours old. As a rule patients do not come early enough for abortive treatment. In severe cases, with marked ardor urinæ, lymphangitis, œdema of the meatus and prepuce, and a blood-stained discharge, local treatment must be deferred till these symptoms have subsided. During this period the treatment consists in immersion of the penis in hot boric lotion several times daily, the application of hot lead and opium lotion, and the administration of **Potassium Bicarbonate** and **Sodium Bromide** 20 gr. four times daily to allay the ardor urinæ and chordee. The patient should drink freely of alkaline mineral waters; three pints of Vichy water daily relieve the dysuria. After ten days of this treatment local urethral medication may usually be commenced. This severe type of gonorrhœa, however, is not so common as the milder form, in which local urethral treatment can be commenced at once. In these cases the patient is instructed to wash out the anterior urethra several times with permanganate solution 1–8000, by means of a hand syringe, and then to inject one syringeful of a solution of one of the silver salts and retain it for ten minutes. This should be performed three times daily for the first four days, after which the permanganate solution is strengthened to 1–4000. At the end of the second week the permanganate is discontinued, the silver solution is injected night and morning, and twice daily one syringeful of the following :—

℞	Bismuth Subcarbonate	℥ij	Boroglyceride		℥ij
	Hydrastis	℥ss	Water	to	℥iv

At this period **Copaiba** and **Santal Oil** are given internally. At the end of the third week, when the discharge is scanty and mucoid, containing few or no gonococci, the silver solution should be supplemented by an astringent injection, such as—

℞	Zinc Sulphate	gr. xij	Hydrastis		℥ss
	Lead Acetate	gr. xv	Water	to	℥iv

If the mucoid discharge persists after the fourth week, the following injection may be used :—

℞	Zinc Sulphate		Hydrastis		℥ss
	Alum	āā gr. xij	Water	to	℥iv

Sulphate of copper and chloride of zinc, 1–500, are also useful. Invasion of the posterior urethra must be looked for by the two-glass test, as posterior urethritis often causes no symptoms.

The treatment of *total urethritis* (anterior and posterior) varies according to the severity of the symptoms. When there is marked frequency of micturition, accompanied by terminal hæmaturia, it is safer to avoid local urethral treatment for a few days. In such cases **Urotropin, Salol,** and opium and belladonna suppositories are recommended. In milder cases, which are only revealed by the two-glass test, irrigations or deep instillations should be employed. Christian recommends daily irrigation of the posterior urethra with permanganate 1–6000, followed by instillations, with a Keyes-Ultzman syringe, of a silver solution, which should be held in the urethra as long as possible. This treatment should be performed daily till the second portion of urine becomes clear. Hand injections should be discontinued by the patient when the posterior urethra is affected.

Christian concludes that the majority of cases require from six to eight weeks for a cure. He is not hopeful regarding the treatment of gonorrhœa by serums or vaccines.

McDonagh[4] gives the results of his experience at Finger's clinic at Vienna. Gonorrhœa should not be diagnosed from the presence of extracellular diplococci alone, because the extracellular life of the gonococcus is a short one, and even in a Gram-negative examination we cannot be sure that they are gonococci. The intracellular life, however, is peculiar to the gonococcus. As regards the examination of filaments, the best plan is to centrifugate the urine, wash the deposit in water, and recentrifugate. Urine should always be examined fresh, especially if cultures are to be made, since the gonococci soon die in urine. Again, pus dissolves in urine owing to the presence of a trace of pepsin ; this solution takes place more quickly in the morning urine, and in warm and acid urine. The presence of gonococci in the filaments is inconstant, but according to Finger, as long as pus cells are present the patient must be regarded as infectious. In Finger's clinic patients are treated by injections. Treatment by balsams alone is insufficient, as the gonococci can be cultivated on santal urine agar. The bactericidal power of the balsams is practically nil, and their chief use is in

moderating subjective symptoms. For prophylaxis, **Protargol** bougies or a protargol-glycerin solution have been recommended.

In the treatment of *acute urethritis* relief is caused by diminishing the acidity of the urine, for which purpose the patient may drink aqua calcis. Painful erections and chordee are relieved by **Opium and Belladonna Suppositories, Monobromate of Camphor,** 6 gr. three or four times daily, or by a mixture of **Bromide of Potassium, Lupulin, and Camphor.** Hæmaturia is checked by **Ergotin** and **Liquor Ferri Perchlor.,** and **Morphia** injections. In acute posterior urethritis **Sodium Salicylate** is valuable. For local treatment of the urethra, there are pure antiseptics, such as **Protargol and Albargin,** and antiseptic astringents, such as **Argentamin, Ichthargan,** etc. The former are used in the early, the latter in the later stages.

In *acute anterior urethritis,* when there are acute inflammatory symptoms (œdema, lymphangitis, blood-stained discharge, and much pain), antiphlogistic treatment, such as compresses of **Lead Lotion,** should be used, and injections postponed till the symptoms have abated. In such cases **Santal Oil, Cannabis Indica,** and **Hyoscyamus** are useful. When the acute symptoms have subsided, injections are commenced, the patient injecting three times daily every eight hours with ¼ per cent solutions of **Protargol** or **Argonin,** increased gradually to 1 per cent. The injections are retained for ten or fifteen minutes in the case of protargol, five minutes with argonin. After a few days of this treatment the discharge consists mainly of filaments, the urine is clear, and the subjective symptoms are nil. When the filaments have disappeared the injections are gradually stopped. The persistence of urethral catarrh—which is said to be always due to the gonococcus and not to syringing—is treated by injections of **Subnitrate of Bismuth** 2 per cent, retained for four minutes and used twice daily. The following rules are given for injections. They should be given at regular intervals every eight hours; the whole of the diseased mucous membrane should receive the injection as far as possible at the same time, which is effected by always injecting the same quantity; the syringe should hold 12 cc. and have a conical end; the meatus should be closed over the conical end of the syringe, and the injection made slowly with equal pressure. If the fluid is injected too quickly the muscles come into action, and it is ejected.

In *acute posterior urethritis* no injections are used till the subjective symptoms have abated. Treatment at first consists in **Sitz Baths,** suppositories, etc., and **Sodium Salicylate** in preference to balsams. As long as there are signs of anterior urethritis, treatment of the posterior urethra by catheters, etc., should be avoided; during this stage the anterior urethra is treated as above. For the local treatment of posterior urethritis two methods are used: (1) Irrigation by catheter (Diday's); (2) Instillation by Guyon's or Ultzman's catheters. In the former method large quantities of dilute solutions are used, in the latter, concentrated solutions in small quantity. The former is milder, and best to begin with. "The patient must have a full

bladder, having passed only a little urine to clear the urethra. Then pass a soft catheter till urine begins to come out; the moment this happens, draw it slowly back till none comes. The eye of the catheter is now in the pars prostatica. Inject fluid along the catheter very gently and slowly, withdrawing it while injecting. All the fluid in the pars prostatica goes into the bladder, mixes with the urine therein, and so never touches the walls of the bladder. The solutions employed are **Protargol** 1 to 2 per cent, **Potassium Permanganate** ·02 per cent, **Zinc Sulphocarbolate** and **Silver Nitrate** ·2 per cent." Injections are made daily, or every other day. Irrigation may also be performed without a catheter (Janet's method). After a few irrigations the discharge diminishes and instillations can be employed. These consist in the injection of 1 cc. of a ½ to 2 per cent solution of silver nitrate into the posterior urethra by Guyon's or Ultzman's syringe. This treatment is continued till the filaments disappear. If urethral catarrh persists, it may be due to slight irritation caused by treatment, or may indicate chronic urethritis. Patients should be kept under observation after apparent cure, as gonococci may still lurk in the glands and follicles and cause a relapse.

In the diffuse catarrhal form of *chronic urethritis* (or subacute urethritis), injections, as employed in the acute stage, are recommended.

In *chronic anterior urethritis* the patient injects himself with **Albargin, Ichthargan, Argentamin** (·02 to ·1 per cent). If the disease is circumscribed to certain areas, which can only be discovered by the urethroscope, these can be treated by **Caustics,** or by **Cacao Bougies,** containing zinc sulphate 2 gr., copper sulphate 1 gr., and silver nitrate ¾ gr.

In *chronic posterior urethritis* injections may be made either with watery glycerin solutions or with lanolin ointments, by means of Guyon's or Ultzman's syringes. The best are gradually increasing strengths of from ½ to 2 per cent **Silver Nitrate,** and 5 to 25 per cent. **Copper Sulphate.** These injections should be preceded by **Massage of the Prostate,** which expresses the pus, etc. from the follicles and opens them to receive the injection. If signs of irritation occur, the treatment should be suspended for a day or two. Silver nitrate is better in more recent, copper sulphate in older, cases. In advanced cases, rebellious to ordinary treatment, an occasional injection of **Resorcin-Glycerin** 25 per cent, or **Trichloracetic Acid** 5 per cent, is often beneficial. For deep submucous infiltrations the **Urethrometer** is used. This is opened up after being passed, and so stretches the urethra. After it has remained in for twenty or thirty minutes, a silver or copper instillation is made. The urethrometer is useful in detecting early strictures, which are at first soft and dilatable, and by its use a permanent stricture may be avoided.

Hayden[5] objects to Janet's method of complete irrigation of the urethra and bladder in acute urethritis, on the grounds:—(1) That it causes severe exudation into the submucous tissue, which leaves the urethra in a thickened, congested, and irritable condition, associated with mucoid discharge which is difficult to cure; (2) That it often

causes spasm of the urethral muscles and the compressor, congestion of the prostate, and loss of elasticity of the urethral walls; (3) That it is unnecessarily severe, and does not reach the deeply seated gonococci. With regard to the new silver salts, he sees no advantage from their use, and considers the results inferior to those obtained by the methods he adopts, which cause rapid absorption of the submucous exudation and restoration of the urethral mucous membrane, the practical results of which are fewer cases of chronic gonorrhœa, stricture, prostatitis, and "other unnecessary sequelæ which result from the over-zealous and too radical treatment of the acute or suppurative stage." As Hayden truly remarks, "in our attempts to annihilate the gonococcus we must not forget that we have a very acute and severe inflammatory process to deal with, which is attacking one of the most delicate and highly sensitive mucous membranes in the body, which, if over-zealously treated in the acute or suppurative stage, leaves the urethra and its contiguous glandular structures, especially the prostate, in a more or less permanently damaged condition." Hayden employs abortive or conservative treatment, according to the stage of the disease.

In the earliest stage, when the discharge shows epithelial cells and free gonococci, *abortive* treatment may be tried, but the patient should be warned that it may fail. This consists in first irrigating with catheter and syringe the fossa navicularis, with sterile water, and then distending it with **Silver Nitrate** solution (10 gr. to the ounce), the urethra being compressed behind the fossa navicularis during these operations. The silver application is followed in a short time by a purulent discharge, which subsides in a few days, and is cured by **Astringent Injections** if the abortive treatment is successful.

If, on the other hand, the treatment has failed to abort the disease, the discharge continues, and contains pus cells and gonococci in increasing numbers. In this case, and also when the patient is first seen with a purulent gonococcal discharge, abortive treatment must be abandoned and *conservative* treatment adopted. The patient is put on a bland, non-irritating diet, and should rest in the recumbent position, if possible, during the first week. To render the urine copious and bland, the patient should take full doses of **Citrate of Potash,** with or without tincture of hyoscyamus. A suspensorium should be worn which does not press on the peno-scrotal angle, the penis being placed in a bag of absorbent gauze. To allay local pain and inflammation the penis should be immersed several times daily in hot **Lead Lotion.** When the disease has passed into the third stage, or stage of decline, injections and balsams are commenced. The best balsam is **Santal Oil,** given in capsules one hour after meals. Hayden does not recommend this in the acute stage on account of its irritating effect on the mucous membrane. Hand injections can be commenced seven to fourteen days after the onset of the attack. Hayden does not recommend the injections to be retained by compressing the meatus on account of over-distending the inflamed urethra.

Injections are begun with warm **Lead Lotion, Boric Acid,** or **Saline Solution**; in a few days these are replaced by weak solutions of **Zinc, Alum,** or **Lead,** either alone or in combination, or weak solutions of **Permanganate of Potash.** The latter drug, according to Hayden, is of great value in the subacute stage, but contraindicated in the stage of acute suppuration. After the discharge has been reduced by hand injections, the bulb should be irrigated daily with a soft catheter and syringe, using at first warm solutions of lead lotion or boric acid, and later on weak solutions of zinc, alum, permanganate of potash, and finally **Silver Nitrate** 1–16,000 gradually increased to 1–4000. When the pus has disappeared, and nothing but flakes and tissue elements remain in otherwise clear urine, irrigations are stopped and instillations commenced. These should be given every second or fifth day, a few drops of silver nitrate solution, 1–8000 to 1–500, being injected into the bulb by means of a soft catheter and instillation syringe. These are discontinued when the urine becomes normal.

If the disease spreads to the posterior urethra, causing *acute posterior urethritis*, the patient should be put to bed for a few days on low diet. All local treatment of the urethra should be stopped, as in every case of posterior urethritis there is prostatitis, which is aggravated by local urethral treatment. Balsams should be temporarily replaced by **Alkaline Mixtures** and **Uva Ursi.** Much relief is obtained by **Hot Sitz Baths** and hot **Rectal Irrigations** of saline solution. When there is high temperature and much dysuria, rectal examination should be made for pus in the prostate or seminal vesicles. When the acute symptoms have subsided, the whole urethra should be irrigated from behind forwards by means of soft catheter and syringe, beginning with **Boric Acid,** then weak solutions of **Zinc, Alum,** or **Permanganate,** and finally **Silver Nitrate** 1–30,000 gradually increased to 1–5000. The solutions must be warm, and increased slowly in strength, especially the silver nitrate, which, if used too strong, may set up vesical tenesmus, exacerbation of acute symptoms, and possibly epididymitis, urethrocystitis, and prostatitis. By means of a hand syringe the amount of fluid and the pressure can be regulated better than by irrigation by hydrostatic pressure. When the urine is clear, except for flakes and tissue elements, irrigation is replaced by instillation of silver nitrate into the posterior urethra and bulb by means of soft catheter and instillation syringe. Prostatic massage, sounds, and the endoscope are used in chronic cases when indicated, but over-dilatation by metal dilators is not recommended, on account of injury to the urethra. As regards the question," When is gonorrhœa cured?" Hayden considers that this is so if the morning urine, examined on several successive mornings, contains no pus or shreds. On the other hand, if there are shreds containing pus or epithelial cells, whether they contain gonococci or not, the urethritis is still uncured and the secretion may be infectious. If the shreds consist of epithelial cells only, they may not be dangerous, but even in this case, sexual connection is not advised. To find whether there are any lurking foci of

disease, the bladder is filled with warm sterile water, after the patient has passed urine; the prostate, seminal vesicles, vasa deferentia, Cowper's glands, and the peri-urethral follicles are then examined and massaged, and any secretion appearing at the meatus is examined. The patient then passes the sterile water, which is centrifuged and submitted to microscopic examination.

Vaccine and Serum Treatment.—Eyre and Stewart[6] report the results of three years' experience of the treatment of gonococcal infections by **Vaccines.**

Their conclusions are as follows: (1) In *acute gonorrhœa*: (*a*) Gonococcus vaccine is distinctly toxic, and exerts a profound influence over the disease. (*b*) In out-patient practice vaccine treatment requires considerable caution. (*c*) A stock vaccine, comprising a dozen different strains, gives results very little inferior to those obtained by using a vaccine prepared from the patient's own gonococci; this is not the rule in most other diseases. (*d*) Small doses repeated at short intervals are more effective than large doses at longer intervals. (*e*) Small doses of vaccine (from 1,000,000 to 10,000,000) are safer than large doses (from 50,000,000 to 100,000,000). (*f*) After an injection of from 500,000 to 2,000,000 the negative phase is either absent or very transient. (*g*) An inoculation of from 5,000,000 to 10,000,000 causes a negative phase of usually not longer than forty-eight hours duration, followed by a positive phase lasting three to five days. (*h*) Vaccines in small doses serve the double purpose of raising and steadying the opsonic index. A steady index just above normal is the most favourable condition for recovery.

(2). In *simple chronic gonorrhœa:* (*a*) Where the gonococcus has ceased to be the infecting organism, these cases are on a par with other chronic inflammatory states, but are often more difficult to cure owing to environment and local conditions. (*b*) Chronic cases where the gonococcus is the only infecting organism are more suitable for vaccine treatment than a mixed infection.

(3). In *chronic gonorrhœa with complications*: (*a*) The estimation of the opsonic index aids diagnosis, and is useful in determining approximately the opsonic state of the blood. Chronic gonococcus infections, however, present clinical features which afford valuable indications during vaccine treatment. (*b*) Where the gonococcus alone is the infecting organism, if the opsonic index cannot be obtained as often as desirable, routine injections of from 1,000,000 to 2,000,000 every three to five days are safe; an interval of five to seven days after doses of 5,000,000; an interval of eight to ten days after 10,000,000. Larger doses than these are seldom desirable. (*c*) Treatment should always be by small and gradually increasing doses at frequent intervals; the use of large doses is even more dangerous than in acute cases, and may be followed by disastrous consequences. (*d*) In orchitis small doses of vaccine quickly relieve pain and symptoms. (*e*) In iritis the pain is relieved forty-eight hours after an injection, and disappears in from three to five days. (*f*) In arthritis the treatment is of consider-

able value. In from twelve to twenty-four hours after doses of 5,000,000 to 10,000,000 the affected joints become more swollen and painful (negative phase), but in thirty-six to forty-eight hours these symptoms subside, pain and tenderness pass away, and movement becomes more free. Any urethral discharge present undergoes the same changes as are mentioned in regard to acute gonorrhœa.

Porter Parkinson[7] reports remarkable results from the injection of **Polyvalent Antistreptococcus Serum** per rectum in cases of *gonorrhœal septicæmia*. He refers to two cases reported by himself and Soltau Fenwick in 1906.[8] In the first case, a woman of 39, the symptoms were those of pyæmia, which was unrelieved by salicylates, quinine, or iodides. Gonococci were found in the vaginal discharge. When the patient was apparently moribund, three rectal injections of 10 cc. of **Antistreptococcus Serum** caused rapid improvement and ultimate recovery. In the second case, a girl of 18, the symptoms were those of acute rheumatism, but did not yield to salicylates. Gonococci were found in the vaginal secretion. Rapid improvement took place after rectal injections of 10 cc. of antistreptococcus serum given daily for fourteen days. Parkinson remarks that these were not cases of secondary infection occurring in patients with gonorrhœal urethritis, as the gonococcus was in each instance found in the pleural exudation, and in the second case in the fluid obtained from the knee-joint. These cases show that the serum has some effect either in inhibiting the growth of the gonococcus, or of neutralizing the effects of its toxins. In order to test this point, a series of control experiments were performed with simple enemata, and rectal injections of antidiphtheritic and of normal horse serum. The results of these were all negative, and no improvement took place till the antistreptococcus serum was used. The antigonococcus serum also proved of no value, and Dowson, director of the Wellcome laboratories, found that the gonococcus readily grew on a medium containing antigonococcus serum, but failed to grow on a similar medium containing antistreptococcus serum.

Parkinson has also tried antistreptococcus serum in cases of *gonorrhœal arthritis* with good results. In these cases the usual methods of treatment were tried first. The effect of the serum was so prompt that it was impossible to doubt that the improvement was due to it. In some of the cases the gonococcus was found in the fluid from the joint, and in all cases it was found in the vaginal or urethral discharge. The latter disappeared without local treatment. Parkinson has also tried the serum in cases where joint trouble was present, with a history of gonorrhœa previously but not in recent years; in some cases the results were as striking as in more obviously gonorrhœal arthritis. In some cases in which the serum treatment is successful, there is no history or evidence of gonorrhœa: for instance, in certain cases of chronic rheumatism, and in conditions resembling rheumatoid arthritis. Two cases of this kind are quoted, both in women; however, both suffered from leucorrhœa. With regard to rheumatoid arthritis,

Parkinson is inclined to the view that this is not a morbid entity, but a condition which may be produced by different bacteria and their toxins, one of which may be the gonococcus. He has tried the serum in other cases of rheumatoid arthritis, the results being sometimes good and sometimes nil, but he considers it worth a trial when other means fail. Recently, he has given the serum in three doses, with an interval of two days between each rectal injection; 25 cc. for the first and last doses, 10 cc. for the intermediate dose.

In *acute gonorrhœal epididymitis* Hagner[9] advocates an open **Operation,** the details of which are as follows: An incision is made through the skin and parietal layer of the tunica vaginalis at the junction of the epididymis and testicle. After evacuation of the fluid, multiple punctures are made in the tunica albuginea with a tenotome. If pus escapes from any of the punctures, the opening is enlarged with a probe, and the cavity washed out with 1–1000 perchloride solution. The tunica vaginalis is washed with perchloride solution and afterwards with normal saline. The incision in the tunica vaginalis is lightly closed with a running catgut suture, and a gauze drain inserted for two days. The advantages claimed for this somewhat bold procedure are immediate relief from pain, and rapid diminution of the induration of both epididymis and cord. The author recommends the operation as a preventive of sterility, owing to the rapid resolution of the inflammatory exudation. Hagner has operated on nineteen cases, and has had no case of septic infection, recurrence, atrophy of the testicle, or other distressing sequelæ.

References.—[1]*Brit. Med. Jour.* June 19, 1909; [2]*N.Y. Med. Jour.* Jan. 23, 1909; [3]*Ther. Gaz.* Mar. 15, 1909; [4]*Pract.* Apr. 1909; [5]*Med. Rec.* July 17, 1909; [6]*Lancet*, July 10th, 1909; [7]*Clin. Jour.* Oct. 28, 1908; [8]*Med. Chir. Trans.* 1906; [9]*Ann. Surg.* Dec. 1908.

GONORRHŒAL EPIDIDYMITIS. (*See* Epididymitis.)

GOUT. *Robt. Hutchison, M.D.*

Pathology.—The true pathogenesis of gout is still much discussed, and no fresh light has been thrown upon it in the past year. There is a growing tendency, however, to reject the view that uric acid is *per se* the essential factor in its causation. Thus Walker Hall[1] is of opinion that "as an etiological entity uric acid must be definitely discarded," and Luff[2] says, "For my part I have ceased to regard uric acid as in any sense a poison." It seems to be generally conceded on the other hand that gout is the result of an abnormal mode of purin metabolism of which the production or retention of uric acid in excess is one of the signs. The way in which uric acid is combined, and the form in which it circulates in the blood, are probably also of greater importance than has hitherto been supposed. The following quotation from a paper by Fenner[3] has important bearings on these questions:—

"The nitrogenous foods oxidized in the process of digestion may be divided into proteins, paranucleins, and nucleins; of these it is only the nucleins that produce uric acid by splitting up and forming nucleic

acid and the purin bases. The purin bases are xanthin, hypoxanthin, guanin, adenin, etc., and it is only in the presence, and by the oxidation, of these that uric acid is produced normally. At the same time, and as a result of the same process, thyminic acid also is formed. Kossel and Minkowski have shown that uric acid will combine and form a compound with thyminic acid. By no process known to chemists can the uric acid be detected when once this compound is formed; it loses its identity and can no longer be precipitated. It is as a constituent of this compound that uric acid circulates in normal blood. We know that it must be present there, yet it cannot be detected; it is its precipitability, not simply its presence in the blood, which occurs in gout. The amount of uric acid contained in gouty blood may not exceed the normal, but it tends to be precipitated, and we may fairly conclude that this tendency is owing to the fact that its combination with thyminic acid has not taken place or has become unstable. If we could discover why this combination of uric acid and thyminic acid has not occurred, an important advance in the knowledge of the pathogenesis of gout would result. Schmoll says: 'There are two possibilities: (1) Uric acid is formed normally, i.e., by oxidation of the purin bases, but is for some reason not combined with thyminic acid; (2) Uric acid is formed synthetically and not by oxidation.' Following up the researches of Minkowski and Wiener, he contends that synthetic production of uric acid actually occurs in gout. By treating a series of gouty cases with thyminic acid Schmoll further proved that the free uric acid in the blood had not lost its power to form a compound with thyminic acid.

"Thus we see that in gout the uric acid produced by the oxidation of the purin bases can combine naturally with thyminic acid, and in this combination passes out of the system, whilst the uric acid of synthetic production has not the amount of thyminic acid at hand necessary for its combination, and this clearly explains why its presence can be detected in the serum. It is therefore this synthesized uric acid deprived of the chance of combining with thyminic acid which is present, and, by its saturation in the serum, becomes precipitated and deposited in the joints and tissues. Again, if the uric acid derived from the oxidized purins be prevented by any cause from combining with the thyminic acid, which comes from the same source, we also have free uric acid in the system."

Treatment.—It is upon the above theory that the treatment of gouty conditions by **Thyminic Acid** (under the name of solurol) has been advocated, and Fenner records several cases in which he has used it successfully in doses up to 8 gr. (in tablet form) three times a day. He considers it an important eliminant of uric acid. On the other hand, he regards the so-called **Uric-Acid Solvent** (salts of lithia, piperazine, citarin, uricedin, urosin, etc.) as valueless—or worse. There is no proof that they dissolve uric acid or prevent the formation of biurate of sodium. Many of them are irritating to the stomach and intestine, and nearly all are depressing. Murrell[4] is also of opinion

" that lithia is of no value in the treatment of gout," and that piperazine is a " test-tube remedy." He speaks highly, however, of **Colchicine** in doses of from $\frac{1}{100}$ to $\frac{1}{32}$ gr., and of its soluble salicylate salt (colchi. sal.), the dose of which is $\frac{1}{60}$ gr. **Iodide of Potassium,** according to the same writer, bears the same relationship to gout that it does to syphilis ; it does no good in the disease itself, but is useful in the sequelæ.

As regards *dietetic treatment* most authorities now insist upon the importance of individualization. The majority also are agreed that foods rich in purins (e.g., liver, sweetbread, brains) should be avoided by the gouty. Boiled meat is preferable to roast, inasmuch as it contains less of the extractives, and white meats are safer than dark. The amount of carbohydrates should be strictly limited, and confined, as far as possible, to the form of bread, potatoes, and fresh vegetables. Salt and other condiments should be forbidden. **Alcohol** is best avoided, but if indicated on special grounds, should be taken in the form of whisky or a light wine well diluted with a natural carbonic-acid water of *low mineralization.*

Martinet[5] discusses in detail the question whether tea, coffee, and chocolate should be forbidden to the gouty, and concludes : (1) Alkaloidal beverages, especially tea, coffee, and chocolate, should be forbidden for uricæmic subjects, especially those whose urine spontaneously precipitates uric acid. (2) Nevertheless, the action of coffee and chocolate appears to be less injurious to the organism than that of meat and the legumins, the latter appearing to predominate, for although uricæmic manifestations are specially frequent in meat-eating races or tea drinkers (Anglo-Saxons), it seems to be rather rare in people who are vegetarians, though they drink tea and coffee (Japanese, Hindus, Arabs, etc.). In short, tea, coffee, and chocolate may be allowed in moderation when the food is principally vegetarian and hypopurinic, but they should be strictly forbidden when the diet comprises much meat, which is the case in most instances of " excretors of uric acid."

REFERENCES.—[1]Quoted by Fenner, *Lancet*, Dec. 19, 1908 ; [2]*Ibid.* ; [3]*Loc. Cit.* ; [4]*Clin. Jour.* May 19, 1909 ; [5]*Med. Press*, May 12, 1909.

HÆMORRHAGE, CEREBRAL. *Rutherford Morison, F.R.C.S.*

Cerebral hæmorrhage, J. l'Hermitte[1] points out, is one of the commonest affections of the nervous system, while its treatment is one of the least satisfactory. The three indications—classical, as we are reminded in connection with the work of Todd—are to calm the movements of the heart, to diminish the excessive flow of blood to the head, and to arrest the hæmorrhage. These aims are seldom realized. Bleeding, the once vaunted remedy, has proved unreliable, and sometimes has aggravated the existing mischief. Medical means comprise free evacuation of the bowels, and attention to the skin and pulmonary circulation. These are good so far as they go, but do not promise very much. Side by side with them are the measures of surgery, implying perhaps greater risk, but holding

out hopes of more effective interference. Compression of the common carotid is first referred to. The branches of the cerebral artery are the most frequent seats of hæmorrhage, and are controllable by way of the carotid. The experimental work of Spencer and Horsley is cited, but it is made clear how almost impossible of efficient practical application such a treatment would be. It would have to be employed at the very outset of an attack to be of any use. The surgical alternative is **Evacuation of the Focus of Hæmorrhage,** and in this connection the pioneer work of Harvey Cushing showed that there were prospects of success, provided that regions of physiological importance had not been destroyed as a result of pressure or distention. Russell and Sargeant have demonstrated the correctness of Cushing's anticipation. It is a noteworthy feature that, even in hopeless cases, a fall from the abnormal high blood-pressure existing results from clearing out the focus of hæmorrhage. Following Russell and Sargeant, l'Hermitte concludes that cases suitable for surgical interference are those in which motor paralysis is strictly localized to one-half of the body and accompanied by profound coma, without tendency to improvement. Such symptoms indicate elevation of intracranial tension, also that hæmorrhage has not invaded the cerebral ventricles. Intracranial hypertension is in truth the indication for trephining, for it may of itself cause death. Bulbar disturbance, with its associated train of respiratory symptoms, is favourably affected by relieving the cerebral tension and the aid thus afforded to the local circulation.

REFERENCE.—[1]*Sem. Méd.* Mar. 17, 1909.

HÆMORRHAGE, NASAL. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

In troublesome cases (post-operative) E. Pynchon[1] recommends packing the nasal passages from the front with gauze moistened with peroxide of hydrogen or vaseline. For this purpose he uses a special **Nasal Tampon Introducer.** He also advises that a hypodermic injection of **Morphine** be given at the same time. **Chloride of Calcium** in 10-gr. doses and **Lactate of Calcium** in 30-gr. doses have also proved of value.

REFERENCE.—[1]*Chicago Med. Rec.* Mar. 1909.

HÆMORRHOIDS. *Sir Charles Ball, M.Ch., F.R.C.S.*

Prof. I. Boas,[1] of Berlin, advocates a treatment based upon the spontaneous cure which follows when internal piles become prolapsed and irreducible from inflammatory swelling or muscular strangulation. This treatment is as follows: After the bowel has been well cleared by purgatives and enemata, the patient is directed to retain the piles prolapsed outside the anus if he can do so. If unable to do so, Bier's suction apparatus is applied and repeated until sufficient œdema of the skin surrounding the anus is induced to render the piles irreducible. The patient is confined to bed, and for three or four days the prolapsed piles become more engorged and tumid, and the surface sometimes ulcerated; after this there is a gradual subsidence

of the tumours, and resolution of the surrounding œdema, the cure being complete in about fifteen days. Boas relates eight cases treated in this way; in one there was some trouble in maintaining the piles in a condition of prolapse, but in the remaining seven, complete and satisfactory cure was attained.

Major Porter, R.A.M.C.,[2] says the necessity for complete relaxation of the sphincter in many operations on the rectum requires the administration of general anæsthetics to a dangerous degree, and demands very constant watchfulness on the part of the anæsthetist, in order to maintain this condition during the whole period of the operation. To paralyze the sphincter without rupturing some of its fibres entails a good deal of force and some judgment. Without an anæsthetist who has had a good deal of experience in this variety of operation, much embarrassment to the operator may occur, owing to the contraction of the sphincter preventing a clear exposure of the area of operation, especially if the requisite dilatation of this muscle has not been procured. In doing some operations for interno-external piles under eucaine, he noticed the great ease with which the sphincter could be dilated, and that it remained quite patulous during the operation. It occurred to him that the use of this drug would be of great assistance if combined with general anæsthesia, and he lately tried it; 10 ccm. of Barker's solution are injected into the external sphincter on each side of the median raphe, the needle being inserted in the middle line and pushed into the muscle in an outward direction. This is done fifteen minutes before the general anæsthetic is commenced, and by the time the patient is under, the sphincter will be found quite paralyzed. It has been found possible to complete the operation under very light anæsthesia—such a degree, in fact, as would be quite useless without previous injection of eucaine and adrenalin. He has been much struck by the comparative absence of pain after the operation—due, he presumes, to absence of bruising and tearing of the sphincter. The lessened amount of anæsthetic which is inhaled by the patient must also contribute to a more rapid return to his normal condition, and lessen the anxiety which must occur to both operator and anæsthetist, especially when dealing with private patients.

References.—[1]*Sem. Méd.* May 12, 1909; [2]*Brit. Med. Jour.* Jan. 2, 1909.

HAIRS, REMOVAL OF SUPERFLUOUS.

E. Graham Little, M.D., F.R.C.P.

Pirie[1] has some useful remarks on the theory and practice of **Electrolysis** in the removal of hairs. If a non-corrodible needle (e.g., platinum or gold) attached to the *negative* pole is used, nascent chlorine appears round the needle, hydrochloric acid is formed, and the hair-bulb is destroyed; when the needle is of material which is acted on by hydrochloric acid, the chloride of the metal used is set free; but the metal is not driven into the cells by ionization, and consequently no staining takes place. If such a needle, however, is attached to the *positive* pole, the ions of the metal are dissociated and driven into

the cells, and staining may then result. A corrodible needle must therefore never be used in connection with the positive pole. If a non-corrodible needle is used connected with the positive pole, free sodium is liberated, combining with the water of the tissues to form caustic soda, which acts as a destructive agent. Since all that is required is the destruction of the root, and the intervening tissues should be protected from the destructive agency, Piric suggests the use of a fine wire insulated to within $\frac{1}{16}$ in. of its point, instead of the ordinary needle. The wire is insulated as follows: Hold the wire in the right hand, and a piece of shellac in the left; the wire is heated in a Bunsen flame, and, while red-hot, embedded quickly in the shellac, all except its point. The wire supplied with fine hypodermic needles is suitable: it is finer than the No. 12 sewing needle, and its blunt point is an advantage.

It is claimed that with electrolysis thus performed no scars are left, and the bulb of the hair is more certainly destroyed; the pain is also probably less.

REFERENCE.—[1]*Lancet*, June 9, 1909.

HAY FEVER.

(*Vol.* 1909, *p.* 358)—Menier recommends the inhalation of **Mentholated Chloroform** (containing 4 per cent of chloroform), with a nasal spray of **Adrenalin** 1–2000 when secretion is excessive.

HEADACHE (Effervescent Mixtures in).

Purves Stewart, M.D., F.R.C.P.

The following prescriptions[1] are examples of convenient and elegant methods of presenting some of the commoner analgesics in effervescent form:—

℞ Caffein. Citrat. ℥ss | Sod. Bicarb.
Sod. Brom. ℥v | Acid. Tartar āā ℥iiss
M. et fac chartulas x. One powder in half a glass of water, and repeated in six hours, if needed.

℞ Acetanilidi gr. viiss | Sod. Bicarb.
Caffein. Citrat. gr. iv | Acid. Tartar. āā gr. lxxv
M. et fac chartulas v. One powder, in half a glass of water, every three hours, if needed.

℞ Acetphenetidini gr. xxiiss | Sod. Bicarb.
Caffein. Citrat. gr. iv | Acid. Tartar. āā lxxv
M. et fac chartulas v. One powder, in half a glass of water, every three hours, if needed.

For these powders to effervesce well, particular care must be taken that they be kept dry.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* June 27, 1908.

HEART, CONGENITAL MALFORMATIONS OF.

Carey F. Coombs, M.D., M.R.C.P.

ETIOLOGY.—Keith's[1] Hunterian Lectures constitute the fullest account of developmental faults in the heart which we possess. The two outstanding points are the importance of mistakes in the development of the cardiac infundibulum, which account for more than half

of the 270 specimens of congenital heart disease examined by Keith; and the fact that the vast majority of such conditions are certainly not due to fœtal endocarditis.

Symptomatology.—A case in which *polycythæmia* was a prominent feature is recorded by Parkes Weber,[2] the red corpuscle count being 10,300,000 per cm., and the hæmoglobin reading 160 per cent. It must be remembered, further, that not only are the corpuscles and hæmoglobin increased per unit of volume of blood, but there is also an increase in the total volume of circulating blood in such cases. This great increase in the oxygen-carrying capacity of the blood is compensatory to the deficient aeration of the blood, and its degree is one measure of the gravity of the cardiac lesion.

In a paper on "inter-auricular communications" Lyon-Caen[3] attributes the *cyanosis* of congenital heart disease to the presence of venous blood in the systemic capillaries (a hypothesis which is by no means proved to the exclusion of all alternatives). According to him, communications between the auricles play a double part in causing cyanosis: (1) Large foramina in the inter-auricular septum, of developmental origin, allow venous blood to pass from the right into the left heart, thus producing a more or less permanent cyanosis. (2) If the channel connecting the two auricles be very small it will remain closed, unless in later life some acquired disease (such as emphysema of the lungs) by raising the pressure within the right auricle, re-opens the channel, allowing of the mixture of the two kinds of blood which is said to be responsible for cyanosis.

The same theory of the production of cyanosis is adopted by D'Espine and Mallet,[4] who describe a case of congenital paroxysmal cyanosis associated with atresia of the pulmonary artery, both ventricles discharging into the aorta. This is said to be the constant accompaniment of congenital paroxysmal cyanosis; the aorta always contains some venous blood, as well as its proper supply from the left ventricle, and the paroxysms of cyanosis are provoked by any circumstance which leads to a preponderance of venous over arterial blood in the mixture which is thrown into the aorta.

Patency of the Ductus Arteriosus.—Gideon Wells[5] gives a good summary of the known facts relating to this particular malformation (which is almost never present without some co-existing deformity of the heart[1]). In any case it is rare; about half of its subjects, more often females than males, fall short of maturity. There may be palpitation and short breath, but cyanosis is slight or absent. The most characteristic features are the thrill and bruit. Both are continuous through the greater part of the cardiac cycle, and both are found within a band-like area at the inner ends of the 2nd and 3rd left interspaces. This area is often dull to percussion. The bruit is transmitted to the carotids.

Prognosis.—Dietrich[6] records a case showing the prognostic import of the slighter degrees of malformation, that of a soldier whose tricuspid valve and right coronary artery were malformed, and in

whom a moderate arteriosclerosis caused a fatal breakdown of compensation. This may be correlated with Lyon-Caen's[3] idea as to the importance of small communications between the two auricles.

References.—[1]*Lancet*, Aug. 7, 14, 21, 1909; [2]*Edin. Med. Jour.* Jan. 1909; [3]*Rev. de Méd.* July, 1909; [4]*Ibid.* Nov. 1908; [5]*Amer. Jour. Med. Sci.* Sept. 1908; [6]*Med. Press*, Feb. 3, 1909.

HEART DISEASES.

Carey F. Coombs, M.D., M.R.C.P.

Etiology and Pathology.

Myocardium.—Babcock[1] describes cases of *chronic myocarditis associated with chronic cholecystitis*, which he assumes to have been the cause of the heart disease; but it is not a convincing theory, and most likely coincidence accounts for the association. No doubt biliary colic tends to precipitate failure of a heart already diseased. *Injury* as a cause of heart disease formed the subject of experiments by Kulbs,[2] who found that injuries of the chest caused hæmorrhage into the cardiac muscle and valves, leaving patches of fibrosis in the former but no trace in the latter. Shaw[3] speaks of three types of cardiac injury: those which are so severe as to be obvious externally, and immediately fatal; cases of "spontaneous" rupture of the heart; and laceration of a diseased valve, a distention of a hitherto normal ventricle, by over-exertion. Cases of spontaneous rupture are recorded by Galt;[4] in one case an atheromatous aorta burst just above the coronary openings; in the other, coronary thrombosis led to softening and rupture of the interventricular septum. Dennig[5] describes the case of a man who died, during the course of pneumonia with pericarditis, of a unique accident—spontaneous rupture of a papillary muscle in the left ventricle, without injury or ulcerative process to account for it. *Measles* is an uncommon cause of acute myocarditis; a case, however, is described by Nicola.[6] *Hypertrophy* has been experimentally induced by Miesovicz[7] by injections of adrenalin; and also by Fleischer and Loeb,[8] who describe histological changes in the hypertrophied myocardium identical with those seen in the clinical hypertrophy of man.

Endocardium.—It is accepted as a fact in France that in some cases of *mitral stenosis* the narrowing is *congenital*. Heitz and Sézary[9] describe two cases associated with other congenital malformations, and others are mentioned by Audebert and Dupont.[10] The English view is expressed by Poynton,[11] who thinks it an infinitely rare event. Possibly it originates in an intra-uterine endocarditis such as Dr. Norman Moore describes in the Lumleian Lectures for 1909.[12] Gallavardin[13] alludes to cases of *aortic stenosis* in young adults due, he thinks, to an endocarditis, either ante-natal or post-natal, but unnoticed.

There are a number of observations bearing on the causation and nature of valvular inflammations. First may be registered the experiments of Torri,[14] who finds that toxins injected into animals,

without bacteria, fail to cause endocarditis ; and those of Fulci,[15] who could not by injection of tubercle bacilli set up a tuberculous endocarditis. Next come certain important observations on the *bacteriology of ulcerative endocarditis*. Horder's paper,[16] which is one of the fullest contributions to the whole subject, gives the findings of 40 cases in which blood cultivations were positive. Of these 26 yielded streptococci belonging to the types most allied to the saprophytic strains found in the alimentary canal ; the influenza bacillus and the pneumococcus claim 5 each, the gonococcus 2, *Staphylococcus albus* 1, and an unclassified organism 1. Much importance attaches to the technique of blood cultivation. At least 5 cc. of blood must be taken, direct from a vein ; this is to be transferred at once to a series of broth tubes, mixing the blood and the broth in varying proportions. Some of the tubes at least should be at once incubated at 37·5 C. ; if after forty-eight hours there is no growth, roll the tube and incubate again. The results noted above, obtained by this method, agree with those derived from bacteriological examination of dead-house material at St. Bartholomew's in the noteworthy predominance of streptococcal cases. Gilman Thompson[17] also records a series of seven cases of streptococcal ulcerative endocarditis. Rosenow[18] in fourteen cases found a " pneumococcus " differing in certain respects from the typical strains ; these differences, to which he attributes the organism's predilection for the endocardium, are lost after culture and inoculation. If early cultures, which have not thus dropped their special characters, are injected into rabbits, they always produce endopericarditis ; older modified cultures have no such effect. These experiments should be compared with Horder's[19] account of the results of inoculation with the less virulent types of streptococcus.

Billings,[20] on the other hand, says that of 14 cases of " chronic infective " endocarditis, 11 were due to pneumococci and 3 to streptococci. The apparent slight discrepancies of Horder's, Rosenow's, and Billings' results are perhaps due to different interpretations of the term " pneumococcus."

The importance of *rheumatic endocarditis* as a factor predisposing to the successful ravages of the valve by other organisms is demonstrated by Horder,[16] who in 150 cases of ulcerative endocarditis found a history of rheumatism or chorea in 72. Moore[12] makes a statement which is, we think, a little beyond the mark, though in the right direction, to the effect that endocarditis is the one lesion always present in every case of rheumatic infection ; a hypothesis which leads him to suggest " heart fever " as a better term than rheumatic fever. The writer of this review, in commenting on the histology of rheumatic endocarditis,[21] notes the presence of nodules of multinuclear cells such as characterize rheumatic myocarditis ; also the origin of the inflammatory changes in the depths of the endocardium and not on its surface, proving that the rheumatic virus reaches the valve *via* the coronary circulation and not from the blood flowing through the cavities of the heart.

Symptomatology and Diagnosis.

Ulcerative Endocarditis.—Osler[22] distinguishes a group of cases to which he attaches the name "chronic infective endocarditis." He reports ten examples, varying in age from 19 to 53. A history of previous rheumatism was the rule, and in most instances a condition of chronic valvular disease passes imperceptibly into one of toxæmia lasting from six to twelve months and characterized by remittent fever, which may at first be the only symptom. A special feature is a painful nodular erythema; the spots are commonest on the fingers and toes, and are transient. In the majority of cases the organism is a mild form of streptococcus. Horder[16] describes a similar group; he considers a hopeful temper characteristic of the symptomatology.

The diagnosis of ulcerative endocarditis rests, according to Horder, upon the association of three sets of phenomena: signs of valvular disease, evidence of embolism, and the discovery of micro-organisms in the blood. Petechiæ are often seen,[17] but as Rosenow points out,[18] they appear late; he considers blood-cultures give the best chance of an early diagnosis. The futility of blood-counts is agreed upon by all the writers. Lucas[23] says that *gonococcal endocarditis* may be (*a*) acute simple, (*b*) acute ulcerative, (*c*) chronic ulcerative, in type. In suspected cases, a careful examination of the genital tract may discover the portal of entry. Horder finds that the fever in such cases shows regular daily intermissions.

The Pulse.—W. Broadbent[24] finds delay of the arterial pulse the rule in aortic incompetence, but very unusual apart from this disorder. The more inefficient the aortic valves, the greater is the retardation of the pulse.

There is no slackening of the tide of interest in the information regarding heart disease to be gained by examination of the *venous pulse*. This has been fully described in previous numbers of the *Annual*,[25] but excellent descriptions will also be found in papers by Lewis[26] and Bachmann.[27] Those who desire a concise and dispassionate account of the technique and scope of the modern methods of studying the venous and other pulsations by means of writing instruments, are referred to Dr. John Hay's very readable little book.[28]

It is in the interpretation of the different types of *cardiac arrhythmia* that these methods have been of such great service; but the distinction between one type and another can be made out as a general rule by "clear thinking," without the aid of special apparatus, as Hering[29] shows. Graphic methods are by no means to be disparaged; but those who have not such means at their disposal may yet study arrhythmia profitably.

1. *Respiratory or Sinus Irregularity.*—In this type the beats are irregular in frequency but not in force. It is increased by digitalis, abolished by atropine. It is due to vagus action, and does not indicate cardiac disease; it is found during and after the acute infections of childhood, in neurasthenia, and in meningitis, and Koblanck and

Roeder[30] describe a reflex form which occurs in diseases of the nasal mucosa. A rare instance of arrhythmia, probably similar in its dependence on vagus action, is described by Laslett ;[31] a middle-aged woman subject for several years to syncopal attacks, occasionally convulsive, associated with stoppage of the heart's action involving auricles as well as ventricles and persisting throughout the time-interval of several consecutive cardiac cycles.

2. *Extrasystoles* are cardiac contractions set up by an abnormally timed stimulation of the heart wall, usually at some point other than that at which normal stimulation occurs, i.e., at the sinus venosus of the right auricle. They occur chiefly in nervous persons and in cases of chronic myocardial disease. Clinically they appear either as premature pulse-beats, or as total intermissions of the pulse, synchronous with premature heart sounds heard on auscultation, and sometimes with a thudding sensation experienced by the patient in the precordial area. This description covers the great majority of cases ; but there are of course complex instances of extrasystole, and Lewis[32] has shown, by means of the Einthoven galvanometer, that groups of successive extrasystoles may occur.

3. *Nodal or Perpetual Arrhythmia* is an absolute irregularity involving force as well as frequency; and obscuring the normal cardiac rhythm entirely. It is the type associated with grave cardiac disease in which the auricles are over-distended and the left auricle at any rate paralyzed. Being cardiac in origin, it is unaffected by atropine, but digitalis diminishes it. Mackenzie ascribes it to transference of the point of cardiac stimulation from the sino-auricular node to the auriculo-ventricular node, and also describes a special form of " nodal bradycardia "[33] in which the lesion causing nodal rhythm by irritation of the auriculo-ventricular node has spread to and irritated a point in the auricular wall, experimental stimulation of which causes bradycardia. (*See also* James's paper).[39] Probably in many cases of perpetual arrhythmia there is more than one factor at work, as Lewis's analysis of a case of mitral stenosis[34] suggests.

4. *Lowering of Conductivity.*—The manifestations of this form of disorder have been fully described by Lewis,[35] and further examples of its more advanced degrees are to be found in papers by Gibson and Ritchie (describing the case of the late Sir William Gairdner),[36] Byrom Bramwell,[37] Turrell and Gibson,[38] James,[39] Bachmann,[40] and Haadwerck.[41] Almost all the work done hitherto refers to hindrances in the passage of the stimulus from the auricles to the ventricles. In this there are various stages. (1) There is lengthening of the interval between the contraction of the auricles and that of the ventricles (the " *a–c* " interval of polygraph nomenclature) ; this can only be ascertained by means of graphic records. (2) Ventricular beats are dropped every now and then, the auricle contracting regularly ; so that the observer notes the occurrence of rhythmic heart sounds which do not fail even when the radial pulse drops a beat. Types (1) and (2) resemble the effect of digitalis on conductivity. (3) Of the auricular

contractions, which may be heard proceeding rhythmically at about the normal rate, only one out of every two. three, or four is followed by a ventricular systole and a radial pulse-beat. (4) Finally, "complete heart-block" is said to occur when auricle and ventricle pursue their own rhythms at entirely independent rates. In such cases the ventricle beats 30 to 40 per minute, the auricle somewhere about three times as fast. In the two latter stages syncopal and epileptiform attacks are common (*see* "Stokes-Adams syndrome," below).

The evidence in favour of referring such phenomena to lesions of the auriculo-ventricular bundle is admirably summarized in Lewis's paper.[35] Experimentally by means of Erlanger's clamp the bundle can be crushed, and every stage of heart-block produced by appropriate pressure with the clamp. Section of the bundle produces complete heart-block. Clinical and pathological evidence is afforded by those cases in which heart-block was demonstrated during life by graphic records taken simultaneously from the veins (representing auricular movement) and from the arteries (representing ventricular movement), and in which autopsy has proved the existence of disease in the auriculo-ventricular bundle. In spite of the close connection between lesions of the bundle and the occurrence of heart-block, there is some evidence to show that the coincidence is not an absolute one. Huismans[42] finds reason to believe in a nervous factor in heart-block, operating through the vagus. Calabrese, at a meeting of Italian physicians,[43] described a case supporting this hypothesis. He also alluded to instances of lesion of the bundle seen post mortem which were not in life associated with heart-block. In such cases conduction is possibly carried on by alternative paths, the existence of which is probable according to certain observers, Paladino, of Naples, and Stanley Kent (who first described the auriculo-ventricular bundle) among them.

The *Stokes-Adams syndrome* consists of partial or complete heart-block *plus* epileptiform or syncopal seizures. Even in cases of complete heart-block such attacks may not occur. The attacks may become slighter and more frequent as heart-block becomes more complete, as in Gairdner's case, the record of which is a masterly contribution to medical literature.[36] On the other hand, attacks of the same kind may occur in association with tachycardia, as in a case recorded by James,[39] and in prolonged arrest of the whole heart as described by Laslett.[31] Russell's Goulstonian Lectures[44] contain a full discussion of the relation between convulsive attacks and failure of the cerebral blood-supply.

5. *Pulsus alternans*, or alternation of weak and strong pulse-beats, with maintenance of an equal time-interval between each beat and the one following, is caused by failing contractility. The diastolic interval following systole is not long enough to allow the enfeebled myocardium to recover its strength, so the next systole is feeble. Recovery from this feeble beat can be accomplished in the normal diastolic interval, so the next beat is a strong one. This in turn is

followed by a weak beat, and so on. The only way in which tracings help us here is in establishing the regularity in frequency of the pulse, and in detecting the slighter variations in its force, as v. Tabora shows.[45] Pulsus alternans, indicating as it does a tiring myocardium unable to rise to the task of adequately emptying the ventricles, is always a grave sign.

In discussing these forms of arrhythmia, a more or less general disturbance of the whole myocardium, or at any rate of some special and particular part, has been postulated. There are, however, phenomena that hint at the possibility of disturbances of function in localized areas only, or spots other than those which are usually so disturbed. For example, Felderbaum and Pollock[46] describe cases in which they believe they have, by means of graphic records, detected a condition of "*pseudohemisystole*," that is, an alternation of effective and ineffective contractions in the left ventricle, the right ventricle meanwhile working normally. Schmoll,[47] under the name of "*ataxia of the heart muscle*," describes cases in which tracings suggest the occurrence of partial ventricular contractions, in which portions of the ventricular wall contract while other portions are at rest. Hewlett,[48] after the injection of strophanthin, found a delaying of right (but not of left) ventricular systole, which he attributes to a depression of conductivity in the part of the bundle of His running in the wall of the right ventricle, caused by the strophanthin.

One more disturbance of rhythm calls for comment, namely, *paroxysmal tachycardia*. Falconer[49] describes two cases occurring in mother and daughter, and summarizes the literature. It occurs at all ages, and may persist from childhood throughout life; heredity plays a definite part, as Kirkland's case shows.[50] The attacks are sometimes excited by severe mental or physical stress. They set in and leave off abruptly, the characteristic feature being an acceleration of the heart up to 150 or even nearly 300 beats per minute. The heart-beats during attacks are often exactly twice, thrice, or four times as frequent as they are between the attacks. During attacks, cardiac dilatation and distress may develop; in Kirkland's case, which ended in death during an attack, cough, flatulence, and aphonia accompanied the tachycardia. The duration of the attack also varies very widely. Definite heart disease may co-exist, or the heart may be otherwise normal. The mechanism of production is not certainly known. Hirschfelder[51] gives experimental and clinical evidence showing that the attacks depend on an increased irritability of the heart-muscle, and especially of the auricles; in his cases, the rapid contractions affected the whole heart in normal sequence, and this was also noted in a case observed by Cowan and others.[52] The increased auricular irritability may arise *sui generis* or be induced by nervous influences. Lewis[53] does not believe in a nervous origin, and considers that there is a type of paroxysmal tachycardia in which the cardiac chambers do not contract in their normal sequence, but in which the auricle fails to contract at the usual time. The effective *treatment* of

paroxysmal tachycardia varies in different cases: in Kirkland's case **Digalen** in 15-drop doses was useful, while Farebrother[54] and Wertz,[55] both sufferers themselves, have been relieved by **Physical Exertion**, such as running or skipping, and by pressure on the carotids respectively. The latter means was effective in a case shown to the writer by Dr. Travers Smith, of Dublin; advocates of the neurogenic theory consider that it is pressure on the vagi which is responsible for this.

Aortic incompetence without bruit is discussed by Bard.[56] In such cases the diagnosis can be made by observation of the peripheral signs of aortic regurgitation and of the peculiarly characteristic "dome-shaped" impulse of the heart. Anders[66] gives reasons for believing that the aortic valves may be rendered incompetent by stretching of the aortic ring without lesion of the cusps.

Vaquez and Bordet[57] compare *orthodiagraphy* with percussion as a means of estimating the size of the left auricle in mitral stenosis. They conclude that neither method replaces the other, so that wherever possible both should be used. Osler,[58] in a paper about recurrent laryngeal palsy complicating mitral stenosis, describes a case in which the diagnosis from aneurysm could only be made by means of the X rays.

Bruits.—A theory of the causation of mid-diastolic bruits at the mitral area was lately advanced by the writer[59] as follows. In patients with either aortic regurgitation, adherent pericardium, or early rheumatic carditis, mid-diastolic murmurs are sometimes heard at the apex. These are so much alike that the mechanism by which they are produced is probably similar in all three conditions. Where they occur in such cases, apart from narrowing of the mitral channel by valvular fibrosis, they are probably due to a current of blood being sucked into a much enlarged ventricle through a mitral channel not so much enlarged and therefore relatively narrow. Gossage[60] agrees in the main with this theory so far as early cardiac rheumatism is concerned, and in its relation to aortic insufficiency it is practically identical with the views of Debove[61] and Cedrangolo.[62] Cole and Cecil have, on the other hand, given details of a number of cases[63] which lead them to believe that the apex-diastolic bruit of aortic insufficiency (the Flint murmur) is nothing but a transmission of the basic murmur. Piersol's[64] paper gives a good summary of the subject. Sewall[65] describes the blurred beginning of the first sound as it is often heard at the apex of a normal heart beating rapidly under the influence of excitement, and alludes to the possibility of mistaking this for an organic presystolic murmur, a point in which anyone who has taught clinical medicine to students will be ready to agree.

Hoppe-Seyler[67] states that a diastolic bruit, loudest over the manubrium and extending thence to the right and into the neck, is a helpful sign in the diagnosis of aneurysmal or general enlargement of the ascending aorta, and therefore of syphilitic aortitis.

Exocardiac bruits are described by Moss,[68] who, in three soldiers, noted a systolic mid-sternal bruit while the arms were raised,

unaffected by respiration; by Hijmans van den Bergh,[69] who has found a loud systolic bruit in pregnant or recently delivered women, localized to the inner ends of certain intercostal spaces and due to enlargement of an intercostal branch of the internal mammary artery in response to the demands of lactation; and by Squire,[70] who describes a soft systolic murmur heard near the cardiac apex and sometimes near the inferior angle of the left scapula, apart from cardiac disease. It is separable from similar organic murmurs by its variation with breathing and with posture. Lewis[71] finds an association between this sign and the presence of pulmonary tuberculosis, especially if the pleura be involved.

Prognosis.

The prognosis in valvular disease is admirably dealt with in a paper by Sir J. Broadbent.[72] It is scarcely suitable for abstraction, but the points may be emphasized, that the outlook in any given case of chronic valvular disease depends on two things, the severity of the valvular injury and the fitness of the myocardium to bear the unwonted burden. Moore[12] says that mitral regurgitation is compatible with long life if free from mental or physical overstrain; but such patients bear pneumonia and influenza badly. Mitral stenosis always shortens life; men and married women with this lesion rarely reach fifty. The liability to sudden death in aortic valvular disease may be deferred for years, and manifest itself in old age. Stanley[73] emphasizes the fact that mitral regurgitation in rheumatic children may quite disappear after several years of ordinary care with restriction of exercise. [This is because the mitral insufficiency in such cases is myocardial and not valvular.—C. F. C.]

Treatment.

Physical Methods.—Wethered[74] regards the value of the Nauheim and other spa treatments as lying principally in the moral effect of change of air and scene. Possibly the carbon dioxide baths have some effect. He considers that muscular action properly controlled is of value, and prefers the **Resistance Exercises** of Schott and the **Hill-climbing** of Oertel to the more complex Zander methods.

Babcock[75] testifies to the value of **Medical Gymnastics** in the early myocardial incompetence of middle life. The patients are usually men, working strenuously at sedentary occupations and eating freely. The result is high arterial tension with disease in the abdominal vessels. The exercises should consist of rhythmic bending and straightening of the trunk and limbs, controlled by a skilled assistant. They should be slow, gradually increasing in vigour, and synchronous with the breathing, which must be regular, deep, and uninterrupted. Benefit is only to be expected in moderate cases, and is evidenced subjectively by improvement in the sense of well-being and by an increase in the field of cardiac response. The pulse slows and improves; the heart becomes smaller, and the apex systolic murmur, if present, may

disappear. Barr[76] also insists on the value of regulated exercise in such cases, and points out the tendency at the present time to overdo the rest treatment of cardiac disease. Hall,[77] of Denver, Colorado, writes of the dangers incurred by persons with diseased hearts who venture into high altitudes, particularly if they over-exert themselves. He finds it is a safe rule to forbid any exertion which induces dyspnœa. The rôle of **Abdominal Massage** in heart disease is thus summarized by Studzinski:[78] It is permissible in all cases of heart disease, and arteriosclerosis is no contraindication. It restores the patient's comfort, and causes obvious improvement in cases of broken compensation. Arterial tension tends to fall rather than to rise under its influence. Herz[79] also recommends light massage of the cæcum, ascending colon, and sigmoid, for the relief of constipation in cases of heart disease.

Arnold[80] states that **High-frequency** treatment reduces the arterial tension in cases where a high pressure is associated with cardiac embarrassment. The average fall is 12 mm., sometimes as much as 40 mm. This relief is more lasting than might be expected.

Diet.—The **Karell Diet** is extolled by Galli,[81] particularly in cases of chronic myocarditis and of cardiac obesity. The plan consists in giving 800 grams of milk per day (200 grams each at 8 a.m., noon, 4 p.m., and 8 p.m.) for seven days, or for three days, followed by a further three days during which an egg is given at 10 a.m., and some biscuit at 6 p.m. The pulse must have a certain amplitude, and renal secretion must be active. The object of the treatment is to reduce the bulk of circulating fluid; the result is to induce diuresis and relieve œdema. Absolute rest is essential. Thirst may be relieved by mouth-washes.

Cardiac Tonics.—Houghton[82] pleads for an international physiological standardization of the cardiac tonics, which are, he says, the most toxic bodies used in treatment. The year's literature contains a great deal about the drugs belonging to this group, and especially about digitalis and strophanthus. Jagic[83] considers **Digalen** the best preparation of digitalis, and recommends its combination with **Caffeine** and **Theobromine** as vasodilators, and also with **Camphor** on the same ground. Strophanthus he reserves for prolonged use and for those patients who cannot take digitalis. Huchard,[84] on the other hand, condemns digalen and extols Nativelle's **Digitalin** because of its constancy. Its cardiac action is manifested in less than an hour, its diuretic action within three days; owing to slow elimination, its action is cumulative. It may be injected subcutaneously in oily solution. The dose varies according to the use for which the drug is destined. The massive "anti-asystolic and diuretic" dose is up to 1 mgram, once or twice daily. This will cause diuresis in thirty-six to forty-eight hours. When its diuretic action is over (after a week or so of administration) a smaller dose of $\frac{1}{2}$ to $\frac{3}{4}$ mgram should be given. The medium dose, recommended for palpitation and in mitral stenosis, is $\frac{1}{4}$ mgram daily for three or four

days, to be repeated every three or four weeks. The small "cardiotonic" dose is $\frac{1}{20}$ to $\frac{1}{10}$ mgram daily; this may be maintained for weeks or months, with intervals of one week in three. Cloetta's[85] researches show that the prolonged use of digitalis has no untoward effect on normal animals, but in rabbits with artificial aortic incompetence it prevents asystole and is associated with a much less considerable ventricular hypertrophy than is seen in animals not treated with it. MacLachlan,[86] in recommending the use of digitalis in disorders of the peripheral circulation, speaks especially of its value in the treatment of "chilblain circulation," that common winter condition of cold blue hands and feet with tendency to chilblains. It is useful also in persons with persistent ulcers on the feet or hands.

Much has been written of **Strophanthin.** The following brief account is a résumé of the papers of Danielopolu,[87] Flesch,[88] Stone,[89] Liebermeister,[90] Hatcher,[91] Hatcher and Bailey,[92] Ettore,[93] Deganello,[94] and Crispolti.[95] The maximum dose that can be safely given is 1 mgram per twenty-four hours (less than this suffices according to Hatcher and Bailey, and Liebermeister advises not more than 1·5 mgram in forty-eight hours). This is usually given at one single dose, either by injection into a superficial vein such as the median basilic, or by injection into the gluteal muscles. In either case it should be dissolved in 1000 to 4000 parts of normal saline. The drug is unsuitable for administration by the mouth (a fact which, as Hatcher remarks, makes it a remedy for emergencies only). Its action is typically that of the digitalis group; systole is reinforced and diastole lengthened, so that arterial tension rises while the pulse-rate is decreased, œdema disappears, and the excretion of urine is increased. The slowing of the pulse is noted in a few minutes after injection, and soon gives place to a re-quickening, which takes the rate back to 80 or 90 per cent of the original. Diuresis is seen in an hour and lasts about eight hours. The cardiotonic effect lasts from twelve to eighteen hours. The exact *modus operandi* is uncertain; some say the drug acts on the vagus, others on the cardiac ganglia, others again on the muscle itself. About the indications for its use there is some difference of opinion. All are agreed upon its value as an emergency drug rather than as a matter of routine. It is equally applicable in cases of heart disease, renal disease, and infectious disorders affecting the myocardium, when the cardiac contractions are enfeebled and the arterial tension is low, or when dyspnœa assumes threatening proportions. It is especially likely to do good in cases where the right heart is particularly embarrassed, and in patients whose heart muscle is relatively healthy. When digitalis causes vomiting, strophanthin is a valuable substitute. Most writers consider it worthy of trial even where other cardiac tonics have failed to act (though, as Stone points out, the addition of strophanthin to digitalis already in circulation may cause a fatal collapse). Ettore, however, says that if digitalis has failed strophanthin will fail also,

and that if one dose (or two at the most) does no good, it is useless to repeat it. It may be given concurrently with diuretics of the caffeine group. It is contraindicated in cases of arteriosclerosis and in advanced renal disease, also in defects of cardiac conductivity.

Symptomatic Treatment.—Goldscheider[96] has a long and detailed article on the treatment of tachycardia. His recommendations for the actual attacks are worth remembering. In nervous tachycardia he advises a recumbent position, cold applied to the nape of the neck or the precordium, and sedatives, especially the **Bromide** group (bromural 5 to 10 gr., bromipin 1 dr., bromalin 15 gr., quinine hydrobromide). **Menthol** applied to the precordium may do good, or gentle rubbing of the same area.

If there is violent palpitation, a pressure bandage may be tried. Attacks of true paroxysmal tachycardia are sometimes checked by a dose of brandy, by mustard plasters on the nape of the neck and the epigastrium, by cocaine and adrenalin applied to the nasal mucosa, or by deep inspirations. Wethered[74] considers **Chloralamide** the best hypnotic in cardiac cases; morphia is permissible as a rule, but is contraindicated by the presence of pulmonary engorgement. For fermentative dyspepsia complicating heart disease he finds **Taka-diastase** valuable.

The Specific Treatment of Infective Endocarditis.—**Sera** were used in several cases by Horder,[16] but in only one did any good result follow; in two of the failures the serum was prepared by using cultures of the patient's own organism. **Vaccines** have been tried in a number of cases. Osler[22] tried them in two cases without effect; Horder[16] twelve times ineffectively; Billings[20] in fourteen cases had no result; and Rosenow's[18] experience is equally disappointing. Both he and Horder found the opsonic index an unreliable prognostic sign. Gilman Thompson,[17] however, claims success in four out of seven cases; Conder and Collins[97] record a case of pneumococcal endocarditis in which vaccine treatment was followed by recovery, and Fette[98] records a case in which vaccine treatment worked an improvement: though it did not save the patient's life.

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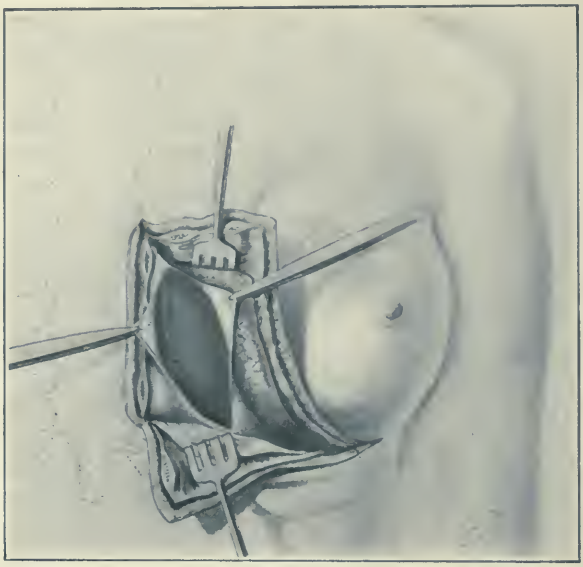

Fig. A.—Long intercostal incision in 5th space, with division of 4th, 5th, and 6th cartilages at their sternal attachments, forming two triangular flaps. Pleura freely opened.

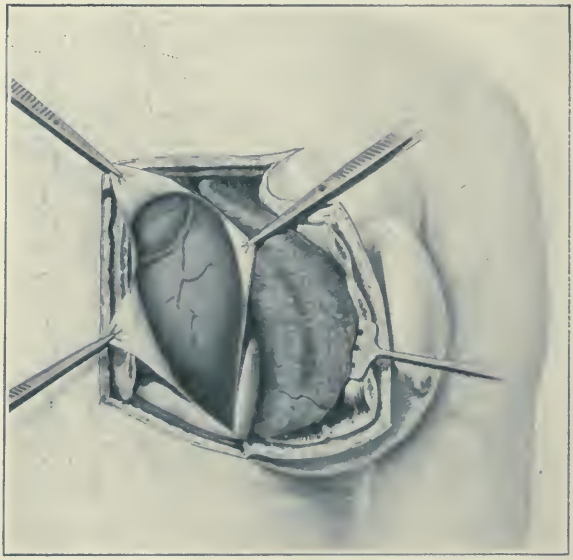

Fig. B.—Quadrangular flap of 3rd, 4th, and 5th ribs, hinge external. The drawing represents in addition the removal of part of the sternum, additional transverse incision in pericardium, accidental tear in pleura, and wound of auricle—C. H. Peck's case. With care in elevating the flap, the pleura may be pushed back without injury.

Vol. i. No. 1 ; [34]*Quart. Jour. Med.* July, 1909 ; [35]*Brit. Med. Jour.* Dec. 19, 1908 ; [36]*Edin. Med. Jour.* Apr. & May, 1909 ; [37]*Brit. Med. Jour.* Apr. 24, 1909 ; [38]*Ibid.* Nov. 14, 1908 ; [39]*Amer. Jour. Med. Sci.* Oct. 1908 ; [40]*Ibid.* Mar. 1909 ; [41]*Münch. med. Woch.* May 4, 1909 ; [42]*Ibid*, Mar. 16 & 23, 1909 ; [43]*Sem. Méd.* Nov. 11, 1908 ; [44]*Lancet*, 1909, i. 963, 1031, 1093 ; [45]*Münch. med. Woch.* Oct. 13, 1908 ; [46]*Jour. Amer. Med. Assoc.* Feb. 20, 1909 ; [47]*Amer. Jour. Med. Sci.* Nov. 1908 ; [48]*Archives of Int. Med.* Vol. ii. No. 2, p. 138. [49]*Pract.* Feb. 1909 ; [50]*Lancet*, June 20, 1909 ; [51]*Johns Hop. Hosp. Bull*, Nov. 1908 ; [52]*Quart. Jour. Med.* Jan. 1909 ; [53]*Heart*, Vol. i. No. 1, 1909 ; [54]*Jour. Amer. Med. Assoc.* July 24, 1909 ; [55]*Ibid.* Aug. 28, 1909 ; [56]*Sem. Méd.* June 2, 1909 ; [57]*Ibid.* May 12, 1909 ; [58]*Montr. Med. Jour.* Feb. 1909 ; [59]*Brist. Med.-Chir. Jour.* Sept. 1908 ; [60]*Lancet*, Aug. 21, 1909 ; [61]*Gaz. d. Hôp.* 1908, p. 1299 ; [62]*Brit. Med. Jour.* Epit. July 24, 1909 ; [63]*Johns Hop. Hosp. Bull.* Dec. 1908 ; [64]*Univ. Penn. Med. Bull.* May, 1909 ; [65]*Amer. Jour. Med. Sci.* July, 1909 ; [66]*Johns Hop. Hosp. Bull.* July, 1909 ; [67]*Münch. med. Woch.* June 15, 1909 ; [68]*Lancet*, Mar. 6, 1909 ; [69]*Sem. Méd.* Mar. 3, 1909 ; [70]*Brit. Med. Jour.* Oct. 10, 1908 ; [71]*Quart. Jour. Med.* Jan. 1909 ; [72]*Med. Press*, Mar. 31, 1909 ; [73]*Birm. Med. Rev.* Sept. 1908 ; [74]*Lancet*, May 22, 1909 ; [75]*Amer. Jour. Med. Sci.* Jan. 1909 ; [76]*Brit. Med. Jour.* Apr. 24, 1909 ; [77]*Jour. Balneol. and Climatol.* Apr. 1909 ; [78]*Centr. f. inn. Med.* June 26, 1909 ; [79]*Brit. Med. Jour.* Epit. Apr. 10, 1909 ; [80]*Bost. Med. and Surg. Jour.* Aug. 1908 ; [81]*Il Policl.* (sez. prat.), Ann. xvi. Fasc. 23 ; [82]*Lancet*, June 19, 1909 ; [83]*Wien. klin. Woch.* Nos. 27 & 28, 1908 ; [84]*Med. Press*, July 14, 1909 ; [85]*Arch. f. Exper. Path. u. Pharm.* 1908, Vol. 1 & 2 ; [86]*Med. Press*, Mar. 3, 1909 ; [87]*Arch. d. Mal. du Cœur, des Vaiss. et du Sang.* Nov. 1908 ; [88]*Wien. klin. Woch.* 1908, xlvi. p. 1590 ; [89]*Bos. Med. and Surg. Jour.* Aug. 19, 1909 ; [90]*Med. Klin.* viii. Beit ; [91]*Amer. Jour. Physiol.* Jan. 1909 ; [92]*Jour. Amer. Med. Assoc.* Jan. 2, 1909 ; [93]*Il Policl.* (sez. med.), June, 1909 ; [94]*Ibid.* (sez. med.), Dec. 1908 and Jan. 1909 ; [95]*Ibid.* (sez. med.), June, 1909 ; [96]*Folia Therap.* Oct. 1908 ; [97]*Pract.* Aug. 1909 ; [98]*Med. Klin.* 1909, No. 6.

HEART, SURGERY OF. *Rutherford Morison, F.R.C.S.*

C. H. Peck[1] reports a case of stab-wound of the heart (right auricle). A quadrilateral flap, with its base at the left breast, and margins following the 2nd rib, centre of sternum, and 6th costal cartilage, was rapidly marked out and dissected back. A portion of the 6th costal cartilage was removed with bone forceps, and the 4th and 5th were cut at their sternal attachment. The 3rd had been cut completely through by the stab-wound, close to its sternal attachment. These three cartilages were again cut and broken at their junction with the ribs to make a hinge, and the flap thus formed of cartilages and intercostal muscles was carefully dissected up and turned back, the pleura being pushed away from its deep surface by gauze pads (*Plate XXXVIII., Figs. A, B*). The pericardial wound was so close to the sternum it was necessary to remove a portion of this bone with bone forceps. Intrapericardial tension was so great that pulsation of the heart could not be felt, even with the finger directly on the pericardium, When the pericardial incision was made, dark blood under tension escaped with a gush. With difficulty, the source of the continuing hæmorrhage was found to be in the right auricle, the wound being the size of a small lead pencil. The heart was not lifted out of the pericardium. The opening was closed by four No. o chromicized catgut sutures on a curved intestinal needle. The flap was then carefully sutured in place, and no drainage was employed. The wound

healed by first intention, and the patient made an uninterrupted recovery.

Peck thinks that the quadrilateral flap with an *external* hinge gives the best exposure, for it can be rapidly formed, with few vessels to control, and makes it possible to avoid injury to the pleura.

G. T. Vaughan[2] reports a case of suture of the heart in a coloured male, aged 32, who was admitted on February 1st, 1908, having just been stabbed in the left breast with a knife. A flap was made of the left 4th, 5th, and 6th cartilages, hinge internal, by cutting through the 3rd and 6th intercostal spaces horizontally, and uniting the outer ends of these incisions by a vertical one crossing the 4th, 5th, and 6th ribs, which were divided at their junction with the cartilages. This flap was

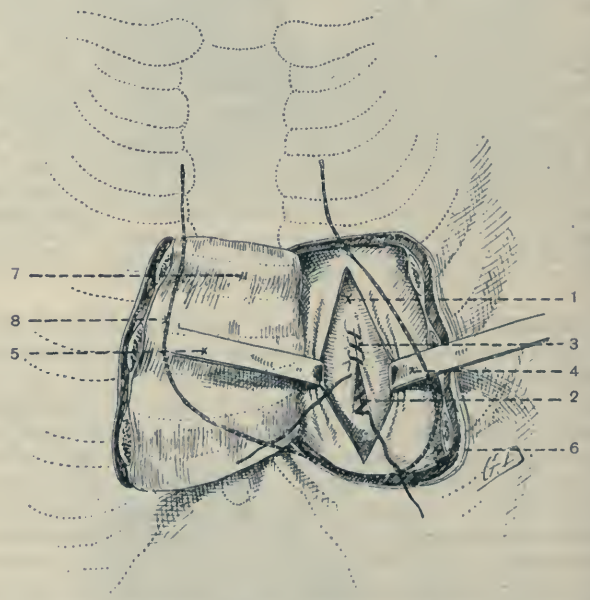

Fig. 42.—Operation for Wound of the Heart. 1, heart; 2, deep sutures; 3, superficial sutures; 4 and 5, retractors on pericardium; 6, left pleural space; 7, flap of chest wall, including 4th, 5th and 6th ribs; 8, heart outlined by broken line.

lifted up, and after the pleura was stripped from it, turned across the sternum, hinging on the left chondrosternal junction (*Fig.* 42). The pleura was widely opened, and the left lung soon collapsed. The wound was traced through the left lung and pericardium into the right ventricle near the interventricular septum. It was about $\frac{1}{3}$ in. long, and entered the cavity of the ventricle near its lower end. There was little blood in the left pleural cavity. The pericardial wound was enlarged to about 3 in., and the wound in the ventricle clearly exposed. A small jet of dark blood spurted out with each systole. The lips of the wound

were caught and held together with hæmostatic forceps, while a continuous suture of fine silk was made. The stitch-holes bled, so that a second row of silk sutures (Lembert) was inserted, and two points which continued to bleed were caught up with forceps and tied with catgut. Hæmostasis was then complete, and the heart beat well and strong. The pericardium and pleura were closed without drainage. Six months later the patient was in good health. Reviewing 150 operations, the author concludes: (1) There is no longer any question as to the propriety of the operation, since 35 per cent of the patients recover, compared with 15 per cent of recoveries after non-operative treatment (according to Holmes and Fisher, 1881)—a gain of 20 per cent. (2) The mortality is practically the same that it was twelve years ago, when the operation was first introduced, and it behoves the surgeon to study the matter, and find a means of improvement. (3) The two great causes of death are hæmorrhage and inflammation of the pleura or pericardium. Probably little more can be done than has been done to prevent death from hæmorrhage, but (4) There is room for great improvement in preventing infection, inasmuch as more than half the patients who survive twenty hours have infection. Besides the observance of strict asepsis, the question of opening the pleura, and of drainage of pleura or pericardium acting as predisposing causes of infection, is of the greatest importance. (5) As a rule, therefore, the pericardium and pleura should not be drained.

L. L. Hill[3] contributes an exhaustive paper on wounds of the heart, reporting three cases. Regarding symptoms, he says there is no cardinal sign of injury to the heart. The location of the external wound, possibly hæmorrhage from it which may spurt; a weak, irregular, intermittent pulse, possibly absent in the extremities; pain, pallor, restlessness, generally dyspnœa; a clear mind, with overwhelming anxiety and distress, are the most common signals. If there is much blood in the pericardium, percussion elicits increased dullness. With the pulsation of the heart a foreign body, as a needle, may be seen to move under the skin. The X ray may furnish valuable assistance, since it shows an enlargement of the cardiac outline, and the presence of any foreign body. He specially cautions against withdrawing anything but the smallest foreign body until the heart has been exposed by operation, because deaths have occurred from hæmorrhage immediately this has been done.

His conclusions are: (1) That any operation which reduces the mortality of a given injury from 90 to 60 per cent is entitled to a permanent place in surgery, and that every wound of the heart should be operated upon immediately. (2) Whenever the location of the external wound and the attending symptoms cause suspicion of a wound of the heart, it is the duty of the surgeon to determine the nature of the injury by an exploratory operation. (3) Unless the patient is unconscious, and corneal reflex abolished, an anæsthetic should be given, preferably chloroform. Struggling is liable to produce detachment of a clot and renew the hæmorrhage. (4) Never

probe the wound, as serious injury may be inflicted upon the myocardium. (5) Rotter's operation renders access to the heart extremely easy, gives an opportunity of removing any extravasation of blood, and inspection of the pleural cavity with reference to the injuries. (6) Steady the heart before attempting to suture it, either by carrying the hand under the organ and lifting it up, or, if the hole is large enough, introduce the little finger, which will serve the double purpose of stopping the bleeding and facilitating the passage of the stitches. (7) When the hæmorrhage is so profuse as to preclude the possibility of suturing, gently lift the heart out of the pericardium with the right hand, introduce from below the left hand, and press between the index and ring finger the vena cava inferior and its inosculation into the right atrium, and pressing upwards displace the inosculation of the vena cava superior. (8) The heart will stand complete compression for a minute and a half, and incomplete for four minutes. (9) Catgut sutures should be used, as wounds of the heart heal in a remarkably short time. The sutures should be interrupted, introduced and tied during diastole, not involve the endocardium, and as few as possible should be passed commensurate with safety against leakage, as they cause a degeneration of the muscular fibre, with its tendency to dilatation and rupture. (10) In cleansing the pericardium, it should be sponged out, and no fluid poured into the sac, for quickly produced tension may cause serious consequences to an already disabled heart. (11) Until every aseptic precaution has been taken, the mechanical stoppage of the heart from accumulation of blood in the pericardium should be prevented by aspiration, as diminished resistance from loss of blood, and want of cleanliness from hurry of preparation, are largely contributive causes to the forty per cent of deaths from infection. (12) Rehn suggests closing the pleura and draining the pericardial sac, but never the reverse, because of the ease of infection of the pleura, which may extend to the pericardial wound and cause the formation of pus in the closed pericardium. (13) For drainage, tubes are preferable to gauze, as the latter is liable to cause retention of the discharge and may strangulate the heart. (14) A needle may be removed at once, but a knife blade must not be touched until the surgeon has bared the heart and is master of the situation, as an uncontrollable hæmorrhage might occur from premature extraction.

Grasman[4] reports two cases of stab-wound of the heart. Both were operated on, but only one, a boy of 14, recovered. The best approach to the heart is gained by a subperiosteal resection of ribs and cartilages. Bacteriological examination of the pericardial contents is recommended. The prognosis is about the same for punctured as for gunshot wounds, 43 per cent of recoveries after operation in each. The left ventricle is the part injured in over half the cases. Death most often takes place two to seven days after the injury.

Flörcken[5] also records a successful case of suture of a stab-wound of the heart. He prefers an incision of the type depicted above, but

operates outside the pleura instead of traversing it. Operation is indicated pre-eminently by evidences of pressure on the heart.

Von Eiselsberg[6] operated on a case of stab-wound of the pulmonary artery. An abscess in the leg followed, and on the fifteenth day the patient, a morphinomaniac, died. Post mortem the sutures (which were easily put in) had done their work, and the wound was healed.

Pericardiotomy.—Meyer,[7] at the New York Medical Society, showed a patient, a male, aged 33, who had had his left pleural cavity repeatedly tapped. Examination showed the presence of fluid in the pericardium; 1250 cc. of black fluid were aspirated, a week later a further 1,000 cc., and a week later a further 1,000 cc. Six days after the second tapping the 6th and 7th rib cartilages were removed on the left side; the pericardium was opened, and 3 quarts of black fluid were liberated; the heart was small, and could not be felt at first. Two long drainage tubes were introduced into the pericardium. He made a slow but perfect recovery, and over nine months later was in excellent condition.

Ellsworth Eliot[8] states that an analysis of cases of suppurative pericarditis hitherto published shows that in the great majority of instances this condition is secondary to some distant focus of infection, while only exceptionally is the infection either introduced directly into the pericardium or of unknown origin. Usually, the entire pericardium is converted into an abscess cavity, the heart, according to Bretano, being displaced downward and forward against the chest wall, a position in which exploratory puncture may readily penetrate one of its chambers. Purulent foci are also occasionally observed in the heart muscle. The lesions of pyopericarditis of unknown origin: those due to penetrating wounds are not always confined to the pericardium and the heart; the infection frequently spreads to the anterior mediastinum and contiguous pleura. The changes in the pleura may either precede or follow those of the pericardium. Where the pyopericarditis is due to a penetrating wound or is of unknown origin, there are constitutional symptoms of a variable degree of sepsis, while the local symptoms are those of a pericarditis with effusion. On the other hand, in secondary pyopericarditis the symptoms are frequently masked by those of the primary lesion, and, particularly in children, the abscess in the pericardium may be entirely overlooked. As an aid to diagnosis, he considers the blood-count an important preliminary to exploratory puncture; there is always a "high" leucocyte count. He does *not* make the puncture close to the sternal edge, but at a point just within the outermost limit of the precordial dullness; the needle more readily penetrates the distended pericardium without damage to the lung or its investing pleura. Usually there is sufficient obliteration by adhesions of the overlying left pleural cavity to prevent any chance of its being opened and contaminated. Attention is drawn to the possibility of the local symptoms simulating a peritonitis. Except where the patient is already *in extremis* or moribund, operative treatment is indicated,

and should take place without delay. A puncture should be strictly restricted to diagnostic purposes. Operation proper consists merely in the opening of the pericardium and in the provision for satisfactory drainage.

He considers that the simplest and most rapid exposure of the pericardium is accomplished by removing the inner part of either the 5th or 6th costal cartilage through an oblique incision parallel to its long axis. If obliteration of the pleural cavity has taken place, the underlying pericardium may readily be opened without danger of pleural penetration; in the absence of adhesions the pleural angle is pushed outwards. After opening the pericardium, the pus is allowed to escape slowly in order that the heart action may not be unfavourably influenced. Any adhesions are separated digitally, and subsequent irrigation with either a saline or weak antiseptic solution is usually employed, though adequate provision must be made for the free exit of the fluid from the interior of the pericardium. The divided edges of the pericardium must be sewn to the skin wherever possible in order to facilitate drainage and to diminish any risk of infecting the anterior mediastinum. Drainage is favoured by the movement of the heart, but a drain—either tube or gauze—should be employed. The persistence of a sinus rarely occurs.

Krüger[9] describes a case of embolism of the pulmonary artery operated on by the Trendelenburg method.

Direct Massage of the Heart in Apparent Death.—Cackovic's[10] attention was attracted to this subject by a case of what proved to be "thymus death" under chloroform. The patient was a boy of 9 being operated on for harelip. When the operation was nearly concluded, the heart stopped beating, and as a last resort the heart was exposed and massaged. Cackovic has found 45 cases on record in which this was done. The massage succeeded in resuscitating the patients in 17 cases, and in 9 of these the patient completely recovered; in the others the heart failed again after working for a longer or shorter interval. In all but 5 cases the syncope occurred under an anæsthetic; in the others from embolism in the pulmonary artery or as the result of attempted suicide by hanging, asphyxia from some laryngeal or tracheal affection, or in a new-born infant. The best results were obtained with massage applied from below the diaphragm; it failed in every case with the transdiaphragmatic technique. The outcome was better the earlier after the syncope the massage was undertaken; the first five minutes gave the majority of successes, while the massage failed constantly if ten minutes had elapsed after the onset of the syncope before the massage was commenced. The prospects are more favourable for direct massage of the heart when the syncope is of circulatory rather than of respiratory origin. When other means of resuscitation fail to elicit the slightest response, and especially in "white" syncope, direct massage is justified; the heart is grasped through the diaphragm, the hand being inserted through an incision above the umbilicus. The ventricles are squeezed rhythmically

between the fingers, or the heart is pushed against the front wall of the chest. The massage must be kept up for a long time, supporting the spontaneous contractions, as otherwise the heart may flag again. Sometimes fully fifteen minutes elapsed before the heart responded to the effect of the massage. Artificial respiration and traction of the tongue should be kept up, with possibly tracheotomy or intubation to ensure a rhythmic supply of air or oxygen to the lungs, the pelvis should be raised, and the abdomen compressed to aid in increasing the blood-pressure by overcoming the paralysis of the vasomotors, supplemented by saline infusion and possibly also injection of adrenalin.

Pierre Mocquot[11] discusses the methods of re-animation by saline and serum injections and of adrenalin, and compares their results unfavourably with those obtained by cardiac massage. In cases of abdominal operation, where the belly is already open, a button-hole opening may be made in the diaphragm, through which the process can be carried out with a finger. When the heart has been exposed by opening the thorax the whole hand can be used, the fingers over the left ventricle, and the thumb over the right, avoiding pressure on the coronary arteries. Some surgeons have massaged through the pericardium, which owing to its flaccidity has obstructed the progress but little. The heart may also be massaged through the combined thicknesses of the diaphragm and pericardium, the hand being inserted through a laparotomy incision. Judging from the published case this seems to be a method of very practical value. Compressive movements can only be successfully carried out during expiration, when the diaphragm is relaxed.

Intravascular and intracardiac injections are further discussed by Mocquot. Intravenous injections, in order to raise arterial tension, require to be of such bulk that they are often the cause of pulmonary œdema. Injections into the arteries should be made in the direction of the heart, and contrary to the direction of the blood current, in the hope of reaching and filling the coronary arteries. Injections may on the other hand be made into the carotid in the direction of the blood current, with the object of clearing the cerebral circulation of anæsthetic poison in cases of chloroform syncope, etc. The precautions necessary are : To avoid injecting too large a quantity, in view of the possibility of pulmonary œdema ; to inject only isotonic solutions ; to ensure injections being of normal blood heat.

The tonic action of adrenalin on the heart is proved. Following the technique of Crile, dogs have been restored after 23 to 35 minutes' apparent death. An injection of 1 to 2 cc. of 1–1000 adrenalin is made into the carotid through a cannula, and in the direction of the heart, this being preceded by injection of saline solution for 10 seconds. Vigorous compression with the hand over the precordial region then effects the restoration of the heart's action. The respiration re-establishes itself. Keen has reported six cases in which Crile applied his method to man ; they include traumatic and electric shock cases, which are always most unsatisfactory. It is, however, stated that

Crile's results are encouraging, though the number of his cases is too small to allow of a very definite judgment. We observe that in clinical practice he uses laryngeal tubage and rhythmic abdominal compression in restoring respiration.

B. M. Bernheim[12] has endeavoured to answer the question of Sir Lauder Brunton, Can a mitral stenosis be transformed by surgical measures into an insufficiency with benefit to the patient? He found mitral stenosis the most difficult of all valvular lesions to reproduce experimentally. Though on numerous occasions the mitral ring was constricted by a suture and the constriction was subsequently divided, it was not possible to reproduce the typical presystolic murmur or the usual symptoms characterising the "button-hole" stenosis in man. Hence the question is still unanswered.

Schwaezwald[13] describes a case in which pins were found in the heart, and summarizes our knowledge of such occurrences.

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HEELS, PAINFUL. *Priestley Leech, M.D., F.R.C.S.*

E. R. Morton[1] records a case of a lady, aged 60, with a history of pain and tenderness in the right foot and heel which had become progressively worse during the past four months. At a later date the left foot and heel began to give trouble in the same way. The pain in the feet had become worse, and tenderness on pressure had so increased that walking was attended by extreme discomfort, and very little exercise had been taken. There was a distinct gouty tendency, but nothing else of a constitutional character. With the X rays (*Plate XXXIX*) a thorn-like process of bone was found projecting forwards on the plantar surface of the os calcis in both feet; the tubercle of the os calcis was also thickened; the thorn-like process was larger on the right heel than on the left. Steinhardt considers that gonorrhœa is one of the most common causes, and that males are more often affected than females, but he admits the condition may be due to gout, rheumatism, and traumatism. Morton was informed recently that a New York surgeon looked on these spicules of bone growing from the os calcis as pathognomonic of gonorrhœal infection.

REFERENCE.—[1]*Lancet*, July 24, 1909.

HEMIPLEGIA, ORGANIC. *Purves Stewart, M.D., F.R.C.P.*

The diagnosis between organic and hysterical hemiplegia is sometimes a matter of doubt, especially in cases where the paralysis is limited to the lower limb, and is therefore monoplegic. In a healthy person, if we analyze an ordinary voluntary motor act, we can recognize several component factors. Of these, the most important, of course, consists in the contraction of those muscles which produce the desired movement in the particular part of the limb. But there are certain

CASE OF PAINFUL HEELS

Stereoscopic radiograph by Dr. Reginald Morton

secondary or accessory phenomena, consisting in the relaxation of antagonistic muscles, and also in fixation or immobilization of other parts of the skeleton. Thus, for example, if a healthy person be laid on his back, and asked to raise the right leg from the mattress, not only does he contract the flexors of the right hip, and extensors of the right knee, but he relaxes their opponents, and also fixes the pelvis by contracting the sacro-lumbar muscles, and by pressing the left heel firmly against the mattress. In a case of organic hemiplegia, as Babinski some years ago pointed out, if we ask the patient, when lying horizontally on the ground, to cross his arms in front of his chest and then to sit up, we observe that the paralyzed leg becomes flexed at the hip, so that the heel is raised from the ground. In hysterical hemiplegia, on the other hand, the paralyzed limb remains immovable. Another useful test is that of Grasset and Gaussel, who have described a phenomenon which is also confined to organic cases. Their sign consists in the inability of a hemiplegic patient to raise both limbs simultaneously from the ground when in the recumbent posture, although he can still lift either limb separately, better of course on the non-paralyzed side. If he raises the leg on the paralyzed side into the air, and holds it there, and if we now grasp the sound leg and lift it, the other limb at once falls, since the pelvis cannot be steadied by the muscles of the paralyzed side. On the other hand, if the patient first raises the sound leg, and we now passively raise the paralyzed one, the sound limb remains in the air, the pelvis having been already fixed by the non-paralyzed muscles of the healthy side. In hysterical paralysis there is no such difference between the separate and simultaneous raising of the two legs. A third method of distinguishing between functional and organic paralysis of the lower limb has been described by Hoover[1] and confirmed by Lhermitte.[2] In an organic hemiplegia, a movement of compensatory opposition of the sound leg can be made out if we place our hand between the sound heel and the mattress, and then ask the patient to raise the paralyzed limb. As soon as he tries to do this we feel the sound heel press firmly against our hand. Conversely, if we ask the patient to press the paralyzed heel firmly downwards against the bed, we feel the healthy heel slightly raised during the effort. In hysterical hemiplegia these movements of " compensatory opposition " of the sound leg are absent. On the other hand, in certain cases of hysterical hemiplegia, the patient, although unable to execute any voluntary movement of the paralyzed leg, may yet show slight voluntary " compensatory " movements in it, when the opposite sound limb is actively raised in the air.

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HERNIA.

John B. Deaver, M.D., LL.D.
Astley P. C. Ashhurst, M.D. } *Philadelphia.*

Local anæsthesia in operations for strangulated hernia is recognized as invaluable in desperate cases; in the case of non-strangulated hernia, when operation is done for " radical cure," surgeons doubtless

are coming more and more to see that local anæsthesia may often (we do not say usually) be employed with advantage. A. R. Morrow[1] writes sanely on this subject when he says: "The amount of pain inflicted can be regulated to a great extent by the operator. Rough handling and pulling on tissues must be avoided. Clear-cut dissection only is allowable, for it must be remembered that cocaine only deadens pain sensibility, it does not abolish the perception of touch. A fidgety, nervous operator will of necessity inflict more pain than one who makes every move and each cut count for something. There is no doubt that every time a blood-vessel is cut or clamped it gives the patient a twinge of pain. It is a mistake to tell a patient that the operation will be devoid of pain, and the next moment give him a sudden shock by clamping some bleeding vessel, and then insist you have not hurt him. This repeated several times causes him to quickly lose confidence in the operator, and he soon becomes nervous, restless, and apprehensive. It is far better to anticipate each little twinge and prepare the patient by telling him what to expect. Failure to observe these little details is responsible for many failures in cocaine work, and results in unjust condemnation of the method, though the fault lies with the operator." The individuality of the patient must also be recognized; some are phlegmatic, others excitable and obstreperous, Some hernias are densely adherent (as from long use of a truss) or unduly large, and will be much more successfully treated with general anæsthesia. Under local anæsthesia the operation moves slowly even in easy cases; in these difficult ones, necessarily prolonged, the time consumed will be longer still under local than under general anæsthesia, and the chances of infection of the wound will be greater, though A. Nast-Kolb[2] reports from Narath's clinique at Heidelberg that no difference in the healing process has been observed since they have adopted local anæsthesia for nearly all hernias, even the very large.

Implantation of Silver Filigree.—This method of cure for very large herniæ, sometimes considered inoperable, has been developed by McGavin,[3] who now invariably uses a double filigree—one iliac and one pubic; he has employed the method with satisfaction in at least 30 cases.

End Results of Operations for the Radical Cure of Hernia.—R. W. Murray[4] traced all but 12 patients out of a series of 217 operations for various forms of abdominal hernia. They were examined two or more years after operation. Only 3 relapses were discovered, all of inguinal hernia. In 2 patients (58 years old) the relapses consisted in a mere bulging of the incision, and in a third the idea of a relapse was based on the unconfirmed report that the patient (age 41) was being treated in another hospital for hernia, which may have been of the opposite side. This extremely creditable showing follows an extremely simple operation.

As was stated in these pages last year by Mr. Rutherford Morison, Murray is an upholder of the theory that practically all hernias, except

traumatic ventral hernias, are due to the existence of a preformed sac; and he thinks that this belief is strengthened by the fact that his operation in the above series of cases consisted merely in the complete removal of the sac, and " for a great many years everybody has been agreed that it is very important to completely remove the sac, and I have not the least doubt that any and every surgeon who has ever operated for the radical cure of inguinal hernia is perfectly satisfied that he did completely remove the sac. I very much doubt it. This is a matter of very great importance, for I am quite sure that the chief cause of failure after operation is incomplete removal of the sac. In examining patients in whom hernia has recurred, I have been at once impressed by the position of the scar. The skin incision had been made far too low—in fact, it encroached upon the scrotum, and did not extend upwards further than the external abdominal ring. Through such an incision it is impossible to excise the sac completely. The lower end of the skin incision should not extend more than ½ in. below the external abdominal ring. I always open up the inguinal canal for about 1½ in., and, having found and isolated the sac, make a point of pulling it vertically upwards, and at the same time brushing back with gauze the vas and other structures clinging to the neck of the sac. I continue to pull the sac upwards and push back the surrounding structures until I bring into view a marked thickening of the peritoneum. This thickening is to be found on the pubic side. I always look for it, and when it appears, know I have reached the limits of the sac. By transfixing and tying the peritoneum through this thickened portion, the limits of the sac have been passed, and when it is cut away the ligatured stump at once disappears from view beneath the internal oblique. This thickening of the peritoneum is physiological. It is present during infancy as well as during adult life, and when operating for inguinal hernia should always be looked for, as it is the only true indication that the limits of the sac have been reached." He then closes the external oblique and the skin without transplanting the cord. Complete and accurate closure of the neck of the sac, we think, is often not obtained by surgeons because they are content to ligate it instead of suturing it, as they would do any other abdominal incision. The simple ligature often slips, and we have seen skilful surgeons, who persisted in the use of the ligature, have this accident (slipping of the ligature) occur on both sides in cases of double inguinal hernia, necessitating the prolongation of the operation, while the peritoneal margins were blindly sought for in the depths of the wound.

In femoral hernia (10 patients traced, no recurrences) he proceeds on the same principle, dissecting the sac up (by wiping with gauze) until the reddish-yellow fat surrounding it changes to the pale-yellow fat found in the subperitoneal tissues; he then knows he has gone far enough, and after removing all the fat around the sac, he ligates it and then merely closes the skin. He quotes Ochsner's experience with 30 cases in which a similar plan was adopted, without a single recurrence.

Rutherford Morison[5] contends that the teaching in some quarters that operations for radical cure of hernia are apt not to be successful in patients over the age of 40 years is wrong. To support his contention he has looked up his operations on such patients, 112 in number (1900–1906). One patient died from undiscovered injury to the bladder, 7 have died subsequently of intercurrent maladies, 33 cannot be traced; but out of 68 examined, only 3 were found with recurrences. He usually combines Kocher's transplantation of the sac with Bassini's operation.

C. Hoffmann,[6] in order to obtain better exposure of the internal ring, where most recurrences are seen, without slitting up the roof of the canal, has for years employed an incision dividing skin and aponeurosis of the external oblique at right angles to Poupart's ligament over the internal abdominal ring. When the sac is emptied and freed, by putting the patient in the Trendelenburg position, very free exposure of the internal ring is gained, and yet the important external oblique remains undivided over the entire course of the inguinal canal.

The Inguinal Method of Ruggi in Operations for Femoral Hernia.—Marchetti[7] calls attention to the advantages which this method (proposed in 1892 by Ruggi, of Bologna) affords, especially in cases of *strangulated* femoral hernia. The difficulty of gaining adequate exposure of the femoral canal from below, led Lawson Tait to laparotomy and reduction of the hernia from within the abdomen, and induced Delagénière to suggest dividing Poupart's ligament, in order to expose the abdominal orifice of the femoral canal. But apart from the added danger and unnecessary mutilation of such operations, which have caused them to be abandoned, mere ease of access to the neck of the sac is not the only thing desirable in operations for strangulated femoral hernia. More important still, Marchetti says, is the free exposure that the inguinal method affords for inspection of the intestine, rendering feasible a resection and anastomosis if necessary; while such procedures can be accomplished only with the greatest difficulty, if at all, by the femoral route. Moreover, in cases of combined inguinal and femoral hernia, Ruggi's method is distinctly superior. Marchetti quotes Bardescu's report[8] of twenty-three operations by Ruggi's method, without a single recurrence.

Inguinal Hernia in Children.—W. H. Evans[9] thinks operation advisable at any time after the first year of life; previous to that time, cure from the use of a truss may be anticipated if it is possible to persist in it for six months. If, at the end of that time, there is even a slight bulging in the canal, or earlier if no truss will keep the hernia reduced, operation should be done. This consists solely in the removal of the sac and its ligation as high as possible, but without opening the inguinal canal.

H. C. Deaver[10] reports 100 cases of herniotomy in children with end results. No operative mortality in this series. Sixty-three cases traced showed no recurrence for periods of one to fourteen years following

operation. All patients were below 14 years of age, the youngest being a baby 28 days old. In this series there were 3 scrotal hernias of large size in children under five months of age.

Strangulated Inguinal Hernia in Infants.—Ashhurst[11] reported 2 cases of recovery after operation, and collected 13 other such operations (all successful) published since Telford's tables of 224 operations were compiled in 1907.[12] The frequency of this condition in children is not sufficiently recognized. The *diagnosis* is not always easy, as the protrusion is frequently small, and unless the possibility of a strangulated hernia be kept in mind, the physician may overlook the true cause of apparent pain and discomfort. In a child of 4 months, recently under Dr. Ashhurst's care, an inflamed hydrocele of the cord was mistaken for a strangulated hernia owing to the history of the sudden appearance of a lump in the groin, with pain, vomiting, and fever. Jopson some years ago mistook deep inguinal adenitis in a baby for strangulated inguinal hernia. But in view of the seriousness of strangulated hernia it is better to err on the side of operation. In a third successful case under Dr. Ashhurst's care, in a boy of 3 years, the only symptom was pain and the presence of an irreducible hernia; there was no nausea or vomiting, and no fever; yet on operation (six hours after strangulation) the gut was found gangrenous, necessitating the inversion of nearly the entire circumference of the bowel.

Hernia of Ovary in Infants.—Nicoll[13] has operated on no less than 62 such cases, without a death. He finds this hernia common under 12 or 18 months of age, uncommon after that date. Apparently the ovary has a slight tendency to return to the abdominal cavity if no operation is done; but an enterocele or epiplocele is liable to take its place; and as strangulation of the ovary may occur at any time, he urges operation as routine treatment. His hospital cases (39 in number) have all been treated as out-patients after operation. In his earlier operations he removed the ovary; but latterly he does this only when it has been strangulated, or when it is too cystic to be treated by ablation of the cysts and replacement.

Hernia of the Bladder is discussed by Mastrosimone,[14] who has operated successfully on seven cases; he concludes that the diagnosis before operation is almost impossible; that it is difficult to recognize the bladder when it is met with during the course of an operation for hernia, even when surrounded by nearly normal tissues; and that this difficulty amounts to an impossibility in complicated cases. Reduction alone is the proper treatment; excision of the portion prolapsed should be reserved for very exceptional cases.

Internal Herniæ.—W. J. Mayo[15] reports two cases of *mesocolic hernia*, caused by pouching of the mesocolon due to the drag and compression of a dilated stomach; the condition was chronic, no actual strangulation being present. MacCallum and Miller[16] narrate a case of intestinal obstruction from a *right meso-jejunal hernia*; death occurred the day after operation. Morton[17] records a case of *hernia strangulated in the foramen of Winslow.* Ashhurst[18] has recently resected a coil

of small bowel which became strangulated in a *hole in the mesentery of the ileum*, (*see Fig.* 43); a Meckel's diverticulum, adherent to the anterior abdominal wall, prevented more of the bowel from passing through the hole. The patient died three hours after operation.

Pectineal (*Sub-femoral*) *Hernia of Cloquet.*—Gaudiani[19] reports an operation for this rare condition, and tabulates the fourteen previously recorded cases. In his own patient the diagnosis was made before operation by the exclusion of femoral and obturator hernias.

Diaphragmatic Hernia and Wounds of the Diaphragm.—Litler Jones[20] reports a case of incised wound of the diaphragm, from broken glass, with prolapse of omentum through the thoracic wound; the patient recovered, after repair of the injury by thoracotomy. He also reports a case of diaphragmatic hernia in a child, probably acquired as the result of injury, eight months previously; when the abdomen

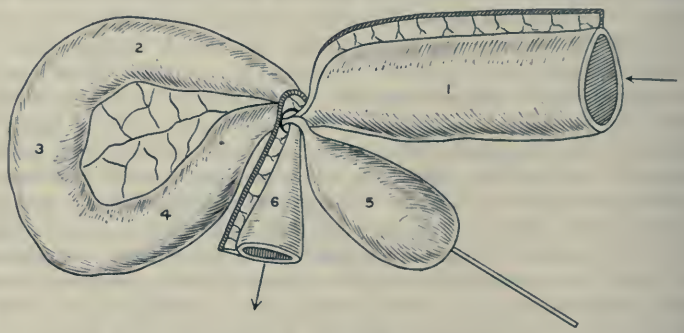

Fig. 43.—Loop of Ileum strangulated in opening in Mesentery, complicated by Meckel's diverticulum. The arrows show the normal fæcal current: The loop of ileum (2, 3, 4) has passed through an opening in the mesentery until arrested by drag on Meckel's diverticulum (5), which springs from ileum at junction of 4 with 6, and which is attached, through fibrous cord running from its tip, to anterior abdominal wall in left hypogastric region (Ashhurst).

was opened (the operation being undertaken for intestinal obstruction of undetermined cause), the colon and omentum were found strangulated in a rent in the diaphragm; but though the gut was successfully reduced and the opening plugged with the adherent omentum, death occurred on the third day.

This second case illustrates the difficulties of diagnosis and the perils of delay in operation. The child had had several previous attacks of incarceration, all since her injury, and if treatment could have been instituted before strangulation occurred, the prospects of cure should have been bright. A history of recurring colic after a severe injury to the thorax or upper abdomen is always suggestive of acquired diaphragmatic hernia, and if this fact were borne in mind, a diagnosis of these not very rare lesions would be less unusual.

Exomphalos.—This term is adopted by Maynard Smith[21] to describe cases of congenital umbilical hernia. In the simpler cases, mere ligation of the cord at a safe distance from the abdominal wall, with

the application of pressure, may suffice. In the severer grades of deformity, however, some more radical procedure is required; this may be either extraperitoneal (Olshausen), or an ordinary operation for the radical cure of umbilical hernia. Radical cure by laparotomy, employed in 94 cases (Adler), gave 65 recoveries and 29 deaths.

References.—[1]*N. Y. Med. Jour.* Oct. 17, 1908; [2]*Münch. med. Woch.* Aug. 18, 1908; [3]*Brit. Med. Jour.* Aug. 14, 1909; [4]*Ibid.* Mar. 13, 1909; [5]*Pract.* May, 1909; [6]*Centr. f. Chir.* Apr. 17, 1909, S. 554; [7]*Il Policl.* (sez. prat.) Sept. 6, 1908; [8]*Arch. f. klin. Chir.* 1908, S. 453; [9]*Brit. Med. Jour.* Jan. 2, 1909; [10]*Albany Med. Annals,* June, 1909; [11]*Arch. of Pediatr.* Dec. 1908; [12]*Med. Chron.* 1906–7, xlv. 275; [13]*Edin. Med. Jour.* Sept. 1908; [14]*Il Policl.* May, 1909, p. 227; [15]*Ann. Surg.* Apr. 1909; [16]*Johns Hop. Hosp. Bull.* Aug. 1908; [17]*Brit. Med. Jour.* Mar. 23, 1909; [18]*Trans. Philad. Acad. of Surg.* Oct. 4, 1909; [19]*Il Policl.* Jan. 1909, p. 13; [20]*Liv. Med.-Chir. Jour.* July, 1909; [21]*Brit. Med. Jour.* Sept. 18, 1909.

HIPPUS, CIRCULATORY. *Carey F. Coombs, M.D., M.R.C.P.*

The size of the pupil is subject to modifications dependent on the amount of blood in the vessels of the iris, which are plentiful. In conditions of the circulation associated with capillary pulsation, a "circulatory hippus" may be seen. Thus Roch[1] records the case of an arteriosclerotic patient, with a hypertrophied heart beating at 50 per minute, in whom capillary pulsation was seen without other evidence of aortic incompetence. Exactly synchronous with each radial pulse a sudden sharp contraction of the pupil was seen. Landolfi[2] examined twenty-four cases of aortic regurgitation, and in one found a similar rhythmic contraction of the pupil. In three others of the series, and in a dog with artificial aortic incompetence, the administration of cardiac tonics brought out the same phenomenon. Roch and Campiche[3] have in several cases (including one of mitral stenosis, and another of adherent pericardium) noted pupillary changes of the same type, but respiratory in rhythm, and associated with a pulsus paradoxus. Contraction coincided with expiration, and dilatation with inspiration.

References.—[1]*Rev. de Méd.* Aug. 1909; [2]*Sem. Méd.* July 28, 1909; [3]*Rev. de Méd.* Aug. 1909.

HYDATID DISEASE (Serum Diagnosis). *George Lovell Gulland, M.D.*

A good deal of work has been done on this subject since Guedini's first paper in 1906, in which he established the presence of specific antibodies in the serum of three persons suffering from hydatid. The most extensive recent study is that of Weinberg.[1] The process employed was based on the fixation of complement by the mixture of the specific serum with the antigen. This fixation is indicated by using sensitized red corpuscles, which remain intact when the serum of the patient contains antibodies of hydatid, but are rapidly hæmolysed when this is not the case. For details of the method, the original papers should be consulted. Weinberg examined 52 cases, and in 27 of these, the diagnosis of hydatid disease was proved by operation. In 26 of these 27 cases, the reaction had been positive.

The suppuration of the cyst does not prevent the reaction. This reaction proved to be much more trustworthy as an index of the presence of hydatid than the occurrence of eosinophilia, and, of course, much more definitely specific, as eosinophilia may be found with any of the animal parasites. Neither urine nor ascitic fluid contained the specific antibodies. After operation, the antibodies may remain in the organism for some time, especially if there has been any absorption of hydatid fluid, but wherever the cyst can be removed entire, with its sheaths, and without incision, the antibodies rapidly disappear from the serum. One point of great importance is the comparative ease with which antigen can be obtained. This is found, of course, in the hydatid fluid, which can be preserved on ice, or in the dry state, for an indefinite time. The precipitin method of diagnosis was found to be much less trustworthy. Kreuter,[2] though from the study of only two cases, confirms these conclusions. He recommends an alcohol extract of the dry residue of hydatid fluid as antigen; 20 parts of absolute alcohol to 1 of the dry residue being the preparation employed. Watery extracts, he found, were not so reliable.

REFERENCES.—[1]*Ann. de. l'Inst. Pasteur*, June 25, 1909; [2]*Münch. med. Woch.* Sept. 7, 1909.

HYPERIDROSIS.

(*Vol.* 1909, p. 375)—The soles of the feet should be painted three times daily with Formalin solutions, beginning with 33 per cent strength and increasing the strength daily. If the skin is broken, weaker solutions must be used to begin with.

INDIGESTION, INTESTINAL. *Robt. Hutchison, M.D.*

This condition, according to Cammidge,[1] is due to a disturbance of the digestive functions of the pancreas and intestinal secretion. From this there results the production of unusual and often irritating chemical products, whilst the growth of an abnormal intestinal flora is also favoured. The diagnosis is made partly from the clinical symptoms and partly from the results of an analysis of the fæces, urine, and stomach contents. Each supplies a certain amount of information, but no one affords a pathognomonic sign. A correct conception of the conditions present in any particular case can only be arrived at by taking into consideration the information to be obtained from them all. The presence of abdominal discomfort, more marked two or three hours after food, loss of appetite, and distaste for certain articles of diet—fat or milk, for example—lassitude, inability to concentrate the attention, with often persistent headache, a dirty tongue which is frequently fissured, fœtid breath with eructations of gas, abdominal distention, and occasional tenderness on deep pressure in the region of the head of the pancreas, the passage of much flatus with often foul-smelling stools, and either diarrhœa or constipation are suggestive of the condition. The analyses of the fæces should be as complete and exhaustive as possible, for the macroscopical, microscopical, chemical, and frequently the bacteriological characters all assist in arriving at

a conclusion as to the nature and extent of the disease. Although much may be learnt from an investigation of the fæces passed on an ordinary mixed diet, it is advisable in some instances to place the patient on a test diet, such as that suggested by Schmidt, when a more accurate estimate of the digestive disturbances can be made. Information as to the particular kinds of food-stuffs that are undigested may also be obtained by the " bead-test," in which pieces of raw catgut, meat, potato, and mutton fat are attached to coloured beads and given by the mouth in a capsule, the beads being afterwards recovered from the fæces and examined.

In the analysis of the urine, attention must be particularly devoted to the " pancreatic " reaction as indicating active degenerative changes in the pancreas and involvement of the gland, the presence of an excess of indican, and a disturbed relation between the preformed and ethereal sulphates; as showing abnormal putrefactive changes in the intestinal contents, with catarrh of the walls, and a marked reaction for urobilin, which points to an associated cholangitis and disturbance of the liver.

The stomach contents should be examined both before and after a test meal for evidences of hyperchlorhydria, catarrh, dilatation, etc., as the intestinal condition is often associated with, and secondary to, disease of the stomach. To obtain really useful information it is necessary that the meal should be of a definite and simple character, and that the test should be carried out under certain conditions. The most generally useful test meal is the Ewald-Boas breakfast, consisting of 35 grams (about two slices) of bread, or toast, without butter, and 400 cc. (about two cups) of water or weak tea without milk or sugar. This should be withdrawn not less than three-quarters of an hour and not more than one hour after it has been taken. In regaining it no water should be used, as this would vitiate the quantitative analysis and so deprive the test of the greater part of its value; if the patient is unable to return the meal through the tube spontaneously, some simple form of suction apparatus, such as that of Senorans, should be used.

Treatment.—This is based upon the pathological findings, and will vary with the cause of the condition, and the degree to which the various factors mentioned contribute to the result. The choice of a suitable diet is the first consideration. The guide to this is the result of the examination of the fæces, from which may be learnt the types of food that are undigested and are contributing most to the irritation of the intestine. The meals should be arranged with the longest possible interval between them, in order that the digestive organs may be given a maximum amount of physiological rest, and if one meal is made as far as may be carbohydrate, while the next is chiefly protein, this end is contributed to. Foods rich in proteins are to be recommended in cases where the production of hydrochloric acid is found to be excessive, and in these cases, too, an eggspoonful of a mixture of equal parts of sodium bicarbonate, magnesium carbonate, and calcium

carbonate after meals, or 1 to 3 parts of hydrogen dioxide in 200 to 300 cc. of water in the morning, fasting, as suggested by Petri, are also useful in controlling the hyperchlorhydria.

In cases where the bacterial element predominates and there is evidence of toxæmia, the use of **Butter-milk,** or better, of a preparation of milk " soured " with a reliable culture of the **Bulgarian Lactic Acid Bacillus,** often gives very good results. In some cases, however, the milk has appeared rather to aggravate the intestinal discomfort and has had to be given up.

Where the results of the " pancreatic " reaction in the urine and the analysis of the fæces point to involvement of the pancreas, the cause of the pancreatitis must first be determined. Pancreatitis is never a primary disease, although the symptoms to which it gives rise may be the dominant features of the case, and to attempt the cure of the pancreatic condition without at the same time treating the cause, is to labour in vain. If infection of the duodenum and pancreatic ducts is present, the treatment of the former should be undertaken along the lines already indicated. The most useful drug for dealing with the infection of the pancreatic duct and biliary passages is undoubtedly **Urotropin.** 5 gr. three times a day is a sufficient dose. Salicylates are also of use.

In the more chronic cases, with marked disturbance of the functions of the pancreas, medicinal treatment may prove of no avail, and resort must then be had to surgical measures, the infected ducts being drained through the common duct and gall-bladder by the operation of cholecystotomy or cholecystenterostomy.

REFERENCE.—[1]*Lancet*, Jan. 23, 1909.

INEBRIETY.

Bedford Pierce, M.D., F.R.C.P.
Norah Kemp, M.B., C.M.

In his report as Inspector under the Inebriates Acts,[1] as well as in a lecture, " Inebriety : its Causation and Control,"[2] R. W. Branthwaite has given valuable information regarding the operations of the Act of 1898. He has pointed out where the purpose of the Act differed from the uses to which it had been put. The Act was framed in the first instance to help the curable cases, and in the second for the care and control of the incurable who might be dangerous to the public. As a matter of fact, it has been mainly used for the latter purpose, and has dealt with only a small proportion of the curable cases. Branthwaite classifies the inebriates committed to reformatories from Courts of Justice under the Act of 1898, into (1) Insane —certified and sent to asylums ; (2) Very defective—imbeciles, degenerates, epileptics ; (3) Less defective—but subject to paroxysms of violence ; (4) Average mental capacity (the standard taken being very low). He finds that only 37·4 per cent are of average mental capacity, and that 62·6 per cent are either insane or defective in varying degree, the very defective being about 17 per cent. The cases of insanity include various forms : mania, melancholia, dementia,

delusional, etc., and a large majority of them were either insane during their police-court history, or bordering on insanity, and that mental disease was the real condition for which they were imprisoned. Nearly all the defective cases were of congenital origin, showing evidence of this in stunted growth, abnormally small heads, misshapen hands, and case after case of developmental arrest. In women, the heavy, repulsive, masculine type is the most common, with a tendency to violence and brutality. The characteristics of the refractory and violent cases are such, that for the safety of the public they have been committed under the Act. Many of them have already served years of punishment for assaults and attempts to kill. In the quieter cases the intelligence is very low, with no power of thought, no memory, and wandering attention; personally unclean, and with no moral sense.

He is therefore strongly of the opinion that inherent mental defect, congenital or acquired, is the real cause of the habitual drunkenness of these people, and the alcohol only the means which has brought this defect to light. Many of them had histories of neurotic heredity, imperfect nutrition during fœtal life, alcoholism in the mother during pregnancy, injury at birth, shock, injury, or disease during fœtal life. The exciting cause could be found in the environment.

He considers the existing facilities for dealing with drunkards unsatisfactory, and urges stronger legislation, and earlier control and treatment of the inebriate, so as to reduce the number of prison sentences which the habitual drunkard is for ever undergoing He suggests the desirability of adopting the principle of guardianship, already in vogue in other countries, in England. If this failed, power should exist for compulsory committal to institution care, on certificate and evidence. If need be, the authorities might resort to an indeterminate sentence, giving the inmate license, from time to time, to be at large.

Claye Shaw[3] suggests that lunatic asylums should be licensed for the reception of the habitual drunkard, who might on recovery be removed to an inebriate home for a time, so that the period of control might, in this way, be prolonged. In the case of a well-to-do patient, he might be sent to a home under certificates, which would hold good for six months, renewable at the end of that time. For this, the authority of some near relative would be necessary, and the patient could be safeguarded by Government inspection, with legal remedies for improper detention.

Mercier[4] also considers drunkenness an insanity. Alcohol, a poison acting upon the highest nerve centres, produces symptoms similar to those produced by the poison of general paralysis of the insane, and both these poisons produce different mental symptoms in different individuals. He suggests that the personal factor must determine the symptoms in both these cases, but only when the dose of the poison is small and recent. Otherwise the dosage determines whether the case is one of ordinary drunkenness, delirium tremens,

or of alcoholic insanity. In view of their mode of origin, gradual culmination, and rapid decline, they resemble diseases due to poisons, such as the specific fevers. Mania, being a more intense disorder than melancholia, is due probably to a larger dose of the poison. Many such cases begin as melancholia, and pass on to mania, and then, as the attack passes off, they pass into a stupid demented condition.

Mott[5] also holds the opinion that the effects of alcohol depend not only upon the quantity and quality of the liquor, and the period of time during which it has been taken, but also upon the physical and mental characteristics of the individual. In asylum practice, in the post-mortem room he rarely found cirrhosis of the liver with ascites, whereas he commonly found it in the post-mortem room of a general hospital. In Charing Cross Hospital, out of 1099 autopsies on adult cases, he found 7·7 per cent of cases of cirrhosis of the liver. This was in accord with the proportion of cases, viz., 8 per cent, in which alcohol was the immediate and direct cause of the disease for which patients were admitted. In Claybury Asylum, notes of 1271 autopsies were investigated; the total percentage of cases of cirrhosis of the liver was 1·8, and there was no case of cirrhosis with ascites, whereas in Charing Cross Hospital there was 66·6 per cent of such cases. In the asylum the cirrhotic livers were to be found in cases of alcoholic dementia, polyneuritic psychosis, and in a few cases of general paralysis. It was common enough to find arteriosclerotic changes associated with cirrhosis of the liver, amongst the insane. In only four of the fatal cases in the hospital had there been any nervous symptoms. On the other hand, Mott remarks how alcoholic cirrhosis of the liver, with pronounced ascites and a history of prolonged intemperance, even of excessive intemperance, frequently occurs in individuals who show absolutely no mental symptoms beyond a weakened will and loss of moral sense. Therefore alcohol, *per se*, is not an efficient cause of insanity, as is proved by Bevan Lewis, who has shown a regional dissociation between alcoholism and insanity, the latter being invariably allied with pauperism, want, anxiety, and other moral factors.

Both in asylum and hospital practice, delirium tremens was found to be more common in men than in women, whereas Korsakow's disease was more common among women. Both occur in subjects of chronic alcoholism. Mott has so often found post mortem, metritis, parametritis, and salpingitis in cases of alcoholic paraplegia, that he considers it probable that the toxins engendered by microbic infection must have been carried up the lymphatics of the nerves, and have in this way exercised an important causal relationship to the polyneuritis. In cases of polyneuritic psychosis, the convolutional pattern of the brain was found to be good, and the convolutional wasting and thickening of the membranes were slight, compared with that occurring in general paralysis. There were only slight changes in the brain of alcoholic dementia, and not sufficient to account for the symptoms,

as they are in general paralysis, where the dementia is in great part proportional to the cortical destruction. In a case of Korsakow's disease, Mott found, on examining sections of the brain, that the only notable change was in the large Betz cells, where there was a perinuclear chromatolysis.

Joseph S. Bolton[6] describes how the family doctor can treat the inebriate by means of the hypodermic injection of drugs, without sending him to an institution. During the acute stage of alcoholism, the treatment must of course be done at home. In this stage he recommends **Apomorphine,** and, with the patient in a recumbent posture, he injects 5 drops of the inject. apomorph. hyp. There may be some slight vomiting, then within five minutes the patient drops off to sleep, which may last for about four hours. If necessary, the injection can be repeated. When the acute stage is over, the drink craving is dealt with. The patient visits the doctor two or three times a day, which in itself has a beneficial effect, apart from the hypodermic injection then given. The mixture used contains **Liq. Atrop. Sulph.** and **Liq. Strychniæ Hydrochlor.** in proportions of 1 to 4, and 5 drops of this are injected into the biceps muscle. A " pick-me-up " such as tinct. capsici (℥iv), and ext. cinchonæ liq. (℥xv), is also given, and the general health of the patient attended to. These injections should be given twice a day at least for two or four weeks, then daily for other two or three weeks, after which the frequency may gradually be reduced. The use of such drugs is only safe under the eye of the doctor, who should keep in touch with his patient for some months after the treatment is over, and should warn him against the likelihood of a relapse.

Treatment of Delirium Tremens with Drugs.—After careful investigation of 500 cases of delirium tremens treated with drugs, S. Walter Ransom, of Chicago,[7] finds that in incipient cases patients respond readily to treatment with **Chloral, Ergot, Bromide,** and **Whisky:** this in order of value. Better results were obtained by giving sedative drugs in small rather than large doses. Given in large doses they tended to increase the mortality in cases of delirum. Ergot was the only drug which reduced the mortality. He gave it in drachm doses of the liquid extract, mixed with whisky. He thought it acted by reducing the cerebral hyperæmia, and so prevented cerebral œdema, viz., " wet brain."

The Effect of Alcohol on the Mind of the Child.—Leopold Lang, of Vienna,[8] has recently discussed this question, and has brought forward considerable evidence to prove that drunkenness in the parents tends to produce grave mental defect in the offspring, whether one or both parents are intoxicated habitually, or only at the time of conception. He quotes Lippich, who found that out of 97 children conceived in drunkenness, only 14 were normal ; also Bourneville, who found that out of 1372 idiot children in whom the circumstances were known, 23·4 per cent were so conceived ; and Bezzola, who showed that in certain wine-growing districts in Switzerland the majority of imbeciles

are conceived at about the period when most drinking takes place. Lang is therefore satisfied with the truth of the statement of a medical man, to the effect that the teachers in wine-growing districts of lower Austria know that a material of very bad scholars in any one year denotes a good vintage six years previously. On these grounds he believes in the special poisoning of germ cells by alcohol at the time of conception. This view is also taken by Krapelin, Ford, and Bevan Lewis.

Crothers[9] has noted that where parents have drunk for a limited period, then have abstained, the children born during the first period show a marked difference in self-control and temperate living from those born later, when the parents were total abstainers. Many descendants of alcoholic ancestors, he says, are very sensitive to their condition, while others are indifferent.

Ralph Crowley[10] states that it is a very rare occurrence for alcohol to poison the germ cells or to affect the development of the brain of the embryo, without the existence of a neuropathic inheritance.

References.—[1]*Brit. Med. Jour.* Jan. 5, 1907; [2]*Ibid.* Oct. 19, 1907; [3]*Lancet*, Aug. 8, 1908; [4]*Clin. Jour.* Dec. 5, 1906; [5]*Brit. Med. Jour.* Sept. 28, 1907; [6]*Brit. Med. Jour.* Oct. 12, 1907; [7]*Jour. Amer. Med. Assoc.* Apr. 17, 1909; [8]*Brit. Med. Jour.* Feb. 6, 1909; [9]*Ibid.* Sept. 11, 1909; [10]*Brit. Jour. of Inebr.* Jan. 1909.

INFANT FEEDING. *Prof. G. F. Still, M.D., F.R.C.P.*

Emphasizing the importance of breast-feeding, Winters[1] says, "In the tenement, in the institution, in the hovel, and the mud hut, mortality of *exclusively* breast-fed children is no higher than in the most salubrious residence." A fact this, which seems to be overlooked by those who lay stress upon sunlight and air, social accident, and environment, as chief factors in the causation of such common diseases as infantile diarrhœa and rickets. Winters ascribes prime importance to fat in the infant's food; he says that in the eight months' fœtus, fat makes 2·44 per cent of the total constituents of the body, and this proportion rises in the full-term infant to 8·7 per cent; the brain, which contains 8 per cent of fat, doubles its weight in the first two years of life; the nerves, which contain 22 per cent of fat, must needs grow rapidly as the body elongates; and the bone-marrow, where the red blood-cells are chiefly formed, contains 96 per cent of fat. The same writer states that "a breast-fed child whose nutrition and development would be considered perfect, probably receives from 6 to 7·5 per cent fat." It may be doubted whether this estimate is correct; careful observations in this country show that the average is far more likely to be 3·5 to 4 per cent, and that trouble often arises when more fat than this is taken, be it in mother's milk or in cow's milk.

When human milk is not available, Winters thinks that gravity cream is greatly to be preferred to cream made by the centrifuge, which he thinks is "as indigestible as cheese," on account of its being thrown out of the natural emulsion more completely than in the gravity preparation.

With breast-feeding, undoubtedly an infant should suck until it is satisfied; it then drops the nipple spontaneously. As Winters says, "nursing by clock is an insufferable absurdity"; but although this is true for the healthy baby, it does not always apply to the baby with a feeble digestion. There are cases in which it is very necessary to limit the time of each feed. As to the time of weaning, Winters regards eight to ten months as altogether too late, and states that the composition of the breast-milk is inadequate for the infant's growth after the second month! It is generally held that suckling should be continued, if possible, until the ninth month, and experience shows that an infant will usually thrive perfectly on the breast-milk alone, where the quantity is sufficient, for this period.

Ewart and Guest[2] have studied the clinical value of the so-called **"Vacca" Milk,** which is stated to be "sterilized without loss of freshness" and "preserved indefinitely without the addition of any kind of preservative." Unfortunately no statement is made as to any test of its supposed "freshness"; and a mere assertion without any evidence that the normal living ferments of fresh milk are present in their "fresh" state, can hardly be taken as of much scientific value. All the infants to whom this Vacca milk was given took it readily, and the effect upon the digestion was good. The stools showed decided improvement where they had been unhealthy when ordinary cow's milk was given. The substitution of Vacca milk sometimes sufficed, without any other help, to cure the dyspepsia due to ordinary milk. Some infants could take it undiluted, and most took it well with less dilution than was required for ordinary milk. So far as the experiments went—they extended over six months altogether; but apparently only one case took the Vacca milk alone for as long as three and a half months—no scurvy or rickets was seen to result. It must be pointed out, however, that much longer and more numerous observations would be necessary, to prove that the milk was free from danger in these respects. Infants fed upon it exclusively, improved in health, in strength, and in weight; but the increase in weight was less considerable than the gain in strength.

The proper condition of milk, however, for all feeding purposes, and especially for the feeding of infants and young children, is *not* that it should be sterilized or preserved, but that it should be *clean* and require neither sterilization nor to be "preserved indefinitely." The Government Hygiene Laboratory at Washington[3] has issued a "bulletin" on milk and its relation to public health; it is pointed out that the three cardinal requirements for a wholesome milk are cleanliness, cold, and speedy transportation from the cow to the consumer. Clean milk does not necessarily mean germ-free milk; even in the udder of a healthy cow, milk is rarely sterile; and it receives more bacteria during its passage through the ducts of the animal's teats. But the number of bacteria is of importance, for where the number is very high, the varieties present are likely also to be numerous and to include some harmful ones; moreover, the

larger the number of bacteria the greater the chemical changes likely to occur in the milk. Hence it comes about that the bacterial content of milk has been accepted as the most practical index of the care used in its production and transportation, and in America a system has come into vogue of "certifying" milk which conforms to certain standards of purity in this respect. In many cities, a Commission consisting of medical men has been established, who sanction the use of a particular stamp or label for milk which comes up to their arbitrary standard, as tested by expert chemists and bacteriologists. The number of bacteria allowed is, in most cases, a maximum of 10,000 bacteria per cubic centimetre, and no pathogenic organisms are to be present. Of course, a higher price is obtained for such milk than for ordinary milk; but the fact that this system of "certifying" milk has extended rapidly over the United States, and is already arousing interest in Europe, shows that there is a demand for such carefully produced milk, even though its cost be high. In America there is recognized also a second grade, known as "inspected" milk, for which the bacterial standard is lower, being 100,000 bacteria per cubic centimetre. If milk is not in conformity with either of these standards, it is recommended that it should be pasteurized, that is, heated to 150° F. for twenty minutes, or to 160° F. for ten minutes.

Pasteurization of milk, according to Rosenau,[4] saves lives and prevents sickness; he points out that heating milk does not render it in any way better as a food: all it does is to destroy certain bacteria and some of their toxic products, and to check certain processes of fermentation and putrefaction, thus rendering the milk safer. He believes that pasteurization never in itself causes the milk to produce scurvy, nor has it any influence in promoting rickets; comparative observations show that infants under the same conditions fed upon heated milk or raw milk do equally well. It must be mentioned, however, that Rosenau considers the proper temperature for pasteurization to be 140° F., and states that the tubercle bacillus, as well as the bacteria of typhoid, diphtheria, dysentery, and other specific diseases, are all rendered harmless by heating to this temperature for twenty minutes. Milk pasteurized thus is said to retain its "vital" properties, that is to say, its enzymes are not materially affected, nor are its germicidal properties destroyed.

Sterilization of milk has at least theoretical disadvantages: the milk ferments are destroyed, and whether for this reason or because of some change in the salts, particularly in the calcium salts, during the heating process, it has been thought that sterilized milk is specially liable to produce scurvy. Variot[5] reports statistics of "more than 3000 infants" fed upon sterilized milk which had been heated considerably above boiling point; no single case of rickets was observed, nor of infantile scurvy; the only troubles which seemed to be specially noticeable amongst infants fed upon such milk were constipation and anæmia. These figures, however, prove nothing

except that scurvy is a rare disease. It has been proved over and over again that sterilized milk is capable of producing scurvy, though probably less readily than do any of the ordinary patent foods used for infant feeding.

Overfeeding with Cream.—Schereschewsky[6] emphasizes the evil results of excess of fat. He says that " the capacity of the organism for the absorption of fat is strictly confined within narrow limits. Whereas an excess of proteids and carbohydrates is disposed of rather easily by the process of metabolism, with fats such is not the case. An excess of fatty food is not absorbed, but remains in the intestine and is there saponified." The apparent " curds " in an infant's stool are often not casein but saponified fats. It is even asserted that cow's milk proteid is almost as easily digestible *per se* by infants as are the proteids of cow's milk, and it is said that if infants are fed on fat-free cow's milk, although the milk be undiluted, and contain 3·5 per cent of cow's milk proteid, no trace of casein is to be found in the stools, even on microscopic examination. The difference in digestibility of a milk containing much fat and a milk containing little or no fat, is shown by the following experiment. A small quantity of skimmed milk is placed in one flask, and a similar quantity of milk, rich in fat, and containing say 5 or 5·25 per cent of fat, is placed in another. Rennet is added to each, and they are moved about so as to simulate peristalsis. In the case of the skimmed milk, a flocculent curd is formed, of which each particle remains separate, whilst the milk rich in fat forms dense heavy curds, which tend to coalesce in masses ; the difference is well appreciated if the experiment is made with narrow-necked flasks, for the curdled skimmed milk pours out quite easily, whereas the curdled rich milk pours out with difficulty, owing to the lumps of curd sticking in the neck of the bottle. Schereschewsky further points out, that infants fed with excess of fat often gain weight with remarkable rapidity for a time, and then the appetite begins to fail, the infant becomes nervous and sleeps badly, ceases to gain weight, and at last actually loses weight ; while after a time symptoms of rickets may appear.

Cream in Infant Feeding.—An important report to the Local Government Board has recently been made by Dr. Hamill[7] on the subject of preservatives in cream. He says it has been customary for many years in the cream trade to use boric acid or boron preparations, as the most suitable preservatives for cream. Preparations for this purpose are made by mixing boric acid and borax in such proportions as to produce a mixture as nearly neutral as possible. Most cream preservatives in addition, contain a small quantity of saccharin, which, in the opinion of some cream dealers, improves the flavour of the cream, and serves to mask incipient sourness. In some cream preservatives, sodium salicylate or sodium benzoate are used to reinforce the preservative effect of the boric acid. The usual quantity present is such as to yield ·25 per cent of boric acid in the cream. Both the ordinary centrifugal cream sold in London, and the clotted cream

made in Devonshire, are found to contain preservatives in many instances. In some cases, moreover, the cream is thickened artificially by the addition of foreign substances such as gelatin, starch-paste, and "sucrate of lime." The effect of boric acid and borax on healthy persons has been the subject of difference of opinion; some have stated that they may exercise an irritative influence upon the alimentary tract, and produce headache, malaise, abdominal discomfort, vomiting, diarrhœa, skin eruptions, and defective assimilation of food. Certainly it is not advisable to give cream containing any preservative to infants, and it is humiliating to find that, even with a clear knowledge of the facts as to its prevalent use by cream traders, our Local Government Board is merely advised that the presence of preservatives should be declared by traders on a label or otherwise, so that the purchaser may be aware of the addition, and that the use of boron preservatives in a certain limited proportion should be allowed on this condition, whereas other countries, for instance, the United States of America, France, and even one of our own colonies, Victoria, are strong enough to prohibit absolutely the use of preservatives of any kind in cream.

REFERENCES.—[1]Paper read before the Brooklyn Medical Society; [2]*Med. Press*, July 7, 1909; [3]*Milk and its Relation to Public Health* (Washington, 1908); [4]*Ibid.* p. 591; [5]*Compt. Rend de l'Acad. d. Sci.* 1904, p. 1002; [6]*Milk and its Relation to Public Health*, p. 631; [7]Report to Local Government Board, 1909.

INFLUENZA. *Robt. Hutchison, M.D.*

Spriggs[1] describes an epidemic of influenza characterized by œdema of the eyelids. The œdema came on suddenly and was usually attended by severe headache. Pyrexia was not always present. The diagnosis may be impossible in an isolated case or in the first of a series, but the presence of other influenzal symptoms in the same or in other patients soon clears up the difficulty. Frontal sinusitis and angio-neurotic œdema may simulate it closely.

TREATMENT OF INFLUENZA.—Bellamy[2] recommends the following formula in simple cases:—

℞	Sodii Salicyl.			Ammon. Carb.	gr. iij
	Pot. Bicarb.	āā gr. x		Aq. Chlorof.	ad ℥ss
	Liq. Ammon. Acet.	℥j			

As a rule, sixteen four-hourly doses tide the patient over the febrile period. **Phenazone,** in 10-gr. doses, may be required for headache.

Salipyrin (a combination of salicylic acid and phenazone) is also very useful, and may be given in 10 or 15-gr. doses every four hours until symptoms subside. The following draught should be taken with it:—

℞	Spt. Ammon. Aromat.	℥xx		Tinct. Card. Co.	℥xx
	Spt. Ætheris Nit.			Aq.	ad ℥ss
	Glycerin.	āā ℥ss			

If pulmonary complications supervene and pneumonia threatens, a calomel and saline purge should be given, mustard and linseed poultices (1 to 6) applied to the bases of the lungs, and a tablespoonful of the following mixture administered every three hours :—

℞ Tinct. Ferri Perchlor. ℥ij | Aq. Chlorof. ad ℥vj
Liq. Ammon. Acet. ℥iss |

Liquor Strychniæ may be added if necessary. Stimulants should be used as required. Under this treatment pneumonia can often be aborted.

References.—[1]*Brit. Med. Jour.* Dec. 12, 1908 ; [2]*Fclia Therap.* Oct. 1908.

INTESTINAL SAND. *Robt. Hutchison, M.D.*

Myer and Cook[1] give a careful review of the literature relating to intestinal sand, and separate the various forms of material which have been described under this head into three classes : (1) Those in which the material really resembled fine sand-like granules, ranging in size from 0·15 mm. up to 1 or even 2 mm. ; (2) Those in which the word gravel or calculus more nearly suits the description than the word sand, the objects varying from the size of a lentil to that of a pigeon's egg or larger ; and (3) Those in which the description of the material itself is so indefinite that we can only infer that, in using the term intestinal sand, the author had before him some sort of intestinal concretion resembling those of either class 1 or 2. They regard class 2 as consisting in reality of fæcal concretions. The finer sand of class 1 consists of a vegetable basis with a varying impregnation of mineral matter. If the latter is in excess, the material is sometimes spoken of as " true " sand, whereas if the vegetable matter predominates it is " false " sand. They show that the banana is a possible source of intestinal sand, the latter being derived from cells containing resin suspended in a fluid rich in tannin. These cells become hardened by the action of the digestive juices, and produce the " sand." The authors do not consider that intestinal sand produces any clinical symptoms apart from those of the constipation with which it is always associated.

Reference.—[1]*Amer. Jour. Med. Sci.* Mar. 1909.

INTESTINES, SURGERY OF.

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Astley P. C. Ashhurst, M.D. } *Philadelphia.*

Important contributions to this subject have been made this year by Barker,[1] Bowlby,[2] Clogg,[3] and Mayo.[4]

Bowlby dwells especially upon the treatment of chronic obstruction of the large intestine, emphasizing the importance of never attempting a resection until the distention has been relieved by means of colotomy ; immediate resection is usually followed by death from sepsis, as the sodden and infiltrated bowel above the resection will not hold the stitches until adhesions are firm enough to prevent leakage. He calls particular attention to the frequently painless and almost symptomless

development of carcinoma of the rectum when not close to the anus, and on the long duration of life after even a palliative operation in such cases.

Barker reviews the technique of removal of tumours of the large intestine, including ileo-colic resections, as well as those of other portions of the colon. He, too, urges the value of preliminary drainage in cases of chronic obstruction : for rectal, or low sigmoid obstruction, colotomy in the left iliac region, or rarely in the transverse colon or cæcum ; for obstruction at the splenic flexure or above, either cæcotomy or a false anus in the lower ileum, if the cæcum is much diseased ; and for cæcal obstruction an ileo-sigmoidostomy. Another plan in cases of sigmoid obstruction is to bring the tumour out of the wound, detaching the mesosigmoid from the diseased bowel ; then to close the wound around the distal and proximal portions of the sigmoid, draining the proximal by a tube ; the tumour may be cut away at once, or after a few days, and after a suitable interval the two ends of the sigmoid may be reunited. Finally, for rectal carcinoma the sacral route alone may be sufficient, or if the growth is high the combined abdominal and dorsal operation is to be preferred. Barker narrates an interesting and successful case of the latter operation, the merits of which are not generally enough appreciated.

The very important paper by Clogg draws attention to the arterial supply of the large intestine as indicating the limits of resection advisable, both on the ground of the blood-supply, as well as for complete removal of the lymph-nodes. Thus the ileocolic and right colic arteries supply the cæcum and the greater part of the ascending colon ; hence it is better to consider this tract of the bowel as one, for the purposes of resection. The middle colic by its two main branches supplies the transverse colon, and the termination of the ascending, and commencement of the descending, colons. The inferior mesenteric artery supplies the remainder.

His studies are based on a series of 72 cases of carcinoma of the colon. Of these 17 were in the region of the ileo-colic and right colic arteries ; in only 2 was the cæcum entirely free from growth. There were 18 in connection with the middle colic artery (5 at the hepatic, 10 at the splenic flexure, and 3 in the transverse colon). There were 37 in the iliac or pelvic colon. Of the whole series, 41 were traced to the post-mortem room ; in only 6 (15 per cent) were there any visceral deposits, showing the strictly local nature of the disease. In 20 other cases the subsequent history of the patients was known, and in only 1 were the clinical signs of visceral involvement unmistakable, thus showing marked accord with the post-mortem findings.

Clogg then proceeds to study the lymphatics invaded by cancers of the colon. His studies appear to bear out his contention that only by removing the entire portion of the colon up to the limits of its arterial supply, can the affected lymph-nodes be successfully eradicated. For cancer in the ileocolic distribution, it is necessary to remove the termination of the ileum and the ascending colon nearly up to the

hepatic flexure; the ileum is then anastomosed to the transverse colon. For cancer of either flexure, it is advisable to remove the corresponding part of the transverse colon. For cancer of the sigmoid region, the sigmoid artery and all it supplies should be removed; he quotes Moynihan as advocating ligation of the inferior mesenteric artery, and an even more extensive resection. Moynihan claims that a lymph-node is always found at the origin of the inferior mesenteric artery, but Clogg has not been able to confirm that statement. As a rule, Clogg finds, the infected lymph nodes lie close to the bowel.

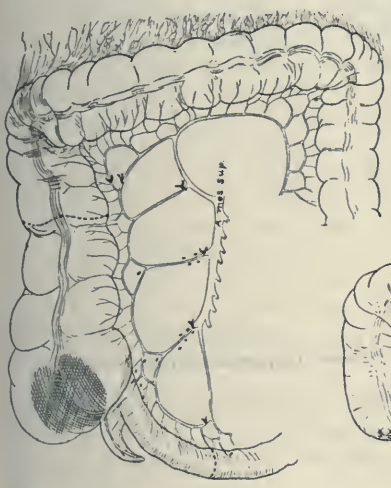


Fig. 44.—Carcinoma of cæcum (dotted lines show lines of resection).

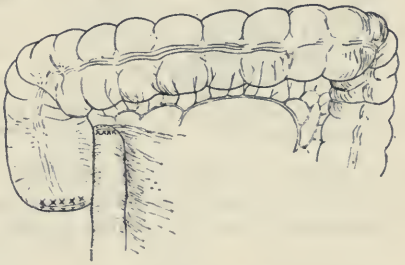


Fig. 45.—Lateral anastomosis following excision of cæcum and ascending colon, between lower ileum and hepatic flexure.

Mayo's paper is based on a series of 100 resections of the large bowel performed by himself and his brother. He calls attention to the vascular areas already described by Clogg, with whose work he does not appear to be familiar. In his series of 100 resections there were 12 deaths, mostly due to sepsis and exhaustion. Malignant disease was the indication for operation in 61 cases (8 deaths), and benign disease in 39 cases (4 deaths). With the same classification as that adopted by Clogg, he considers malignant disease of the colon in three groups: (1) Cæcum and ascending colon, 24 resections, with 3 deaths; (2) Transverse colon, including both flexures, 7 resections, with 1 death; (3) Descending colon and sigmoid, 30 resections, with 4 deaths. In the technique adopted, he closely follows the methods worked out some years ago by Hartmann, Quénu, and others, and recently described at length by Clogg in the paper just quoted. The illustrations (*Figs.* 44–49) reproduced from Mayo's paper, show the limits of resection and method of anastomosis. Of 11 patients with carcinoma of the cæcum operated on more than three years ago, 10 have been traced; 6 (60 per cent) are alive and well to date. Out of 6 patients with sigmoid cancer, operated on more than three years ago, 3 (50 per cent) are now alive and well.

Among the 39 resections for benign disease, 14 were for tuberculosis, of which 12 involved the cæcum and ascending colon. In his earlier

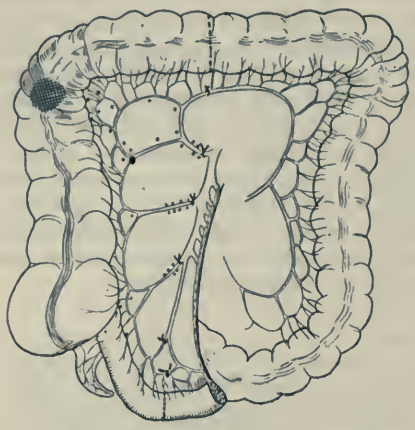


Fig. 46.—Cancer of hepatic flexure (dotted lines show proposed resection).

Fig. 47.—Lateral anastomosis following resection of hepatic flexure between lower ileum and transverse colon.

cases palliative operations generally were adopted if a complete removal of the lymph-nodes seemed impossible, but in a small number of incomplete resections, good health has been maintained for years

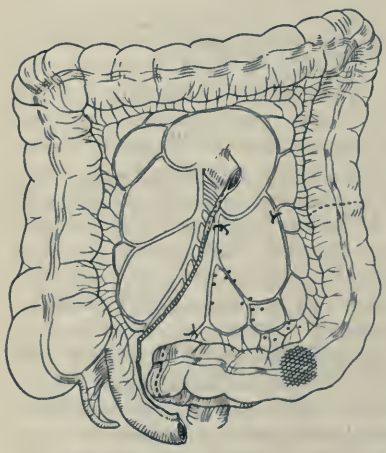


Fig. 48.—Cancer of sigmoid (dotted lines show proposed resection).

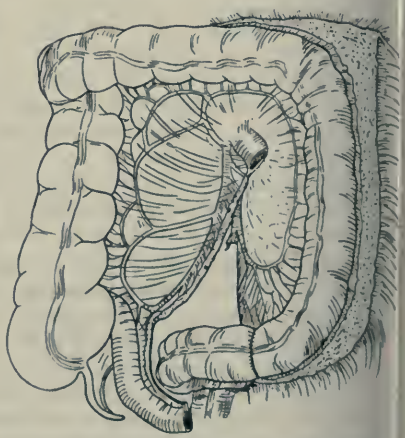


Fig. 49.—End-to-end anastomosis following resection of sigmoid. Note mobilization of splenic flexure and descending colon.

after operation; apparently, he says, when the source of the infection is removed, the patient's natural powers of resistance are sufficient to overcome the remaining disease.

Peterman[5] reported 115 cases of carcinoma of the colon, treated in Rotter's clinique; 57 were inoperable. There were 47 cases of obstruction; in 30 of these an artificial anus was made, with 14 fatalities; resection of the tumour was done in 14 cases, and of these, 11 patients died; side-to-side anastomosis was done in 4 cases, and 2 of these died; these are figures which merely serve to emphasize the futility of doing any but an extremely simple operation on patients with chronic obstruction. Radical operation was undertaken in 52 patients, there being 11 deaths attributed to the operations employed. The best results followed a two-stage operation; 23 such cases gave only 3 deaths.

Maylard[6] has adopted an invagination method of anastomosis in four cases, with the purpose of shortening the time required for performing this operation. After closing the open end of the distal segment, he passes a sling suture through the open end of the proximal segment, passing the second end of his thread through the eye of the needle after completing his suture. Then the upper segment is drawn through a lateral opening in the lower segment by means of this sling suture, and the needle controlling the sling suture is made to emerge through the wall of the lower segment at a distance of about 2 in. below the opening, so that a short portion of the proximal segment is invaginated into the distal. As this sling suture is held taut by an assistant, a single row of interrupted Lembert sutures is applied to unite the opening in the distal segment to the circumference of bowel passing through it. Only one row is required. Then the needle controlling the sling suture is unthreaded, the suture withdrawn, and the puncture closed. *Fig.* 50 shows the invaginated bowel held taut by the sling suture, ready for the application of the Lembert sutures around the anastomosis. The method is particularly applicable to ileocolic implantations, and Maylard suggests that the invaginated gut may perhaps act somewhat as the ileocæcal valve.

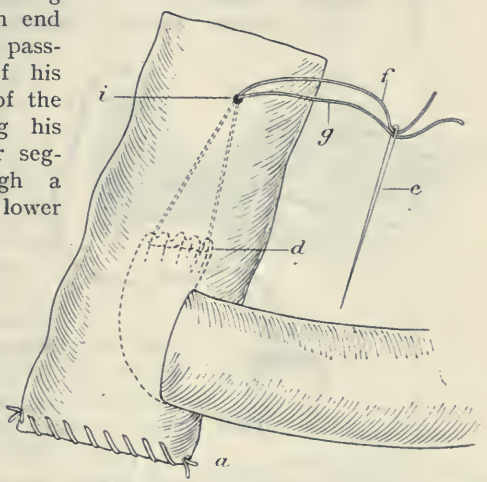


Fig. 50.—Anastomosis by invagination. Shows proximal segment invaginated into distal segment by means of sling suture *g*, *f*. The needle *e* has been made to perforate the bowel at *i* by passing from within outwards.

Intestinal Obstruction.—The treatment of this affection is one of the bugbears of surgery. C. A. Morton[7] eloquently pictures the

disasters, the perils, the trials, and the failures of operations undertaken when the stage of distention has been reached. He questions the generally accepted belief that the coils of small intestine are paralyzed by distention so easily as they are thought to be; he holds rather that kinking prevents the various loops from emptying themselves into one another, and contends that if kinks were absent a single opening in the small gut would be as efficient in emptying it throughout its entire extent as is a single opening in the colon in relieving distention of the entire large bowel. The use of a glass tube, according to Monks' method, is not very encouraging in securing permanent improvement; in our own hands it has indeed served the purpose of euthanasia; but so uniformly fatal are the results of operation when once distention is marked, that there is scarcely any operation approached by surgeons with equal reluctance. As dying men catch at a straw, so may surgeons welcome the suggestion of J. W. Maury,[8] that the cause of death is to be found in some form of autointoxication connected with inability of the duodenum to rid itself of its varied secretions. As is well known, the higher the obstruction, the more rapidly do desperate symptoms appear. He relieved this condition in dogs by retrograde irrigation of the duodenum, as shown in the accompanying diagram (*Fig.* 51). Could it be shown that a similar method in man would tide the patient over the crisis of the disease, and enable his metabolism to readjust itself to the altered conditions present in obstruction, surgery would gladly record one more debt to experimental physiology. Certainly the distention of the intestines is not the cause of death; nor is peritonitis always present in these patients to a fatal degree. There is some cause more serious than mere mechanical interference with the onward passage of the bowel contents, and practical surgeons the world over should study Maury's article carefully, and try to see their way clear to solving the difficult problem.

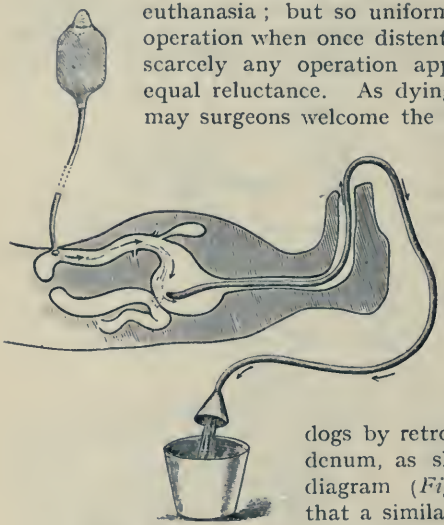


Fig. 51.—Retrograde lavage in a dog. This removes the toxic duodenal products more quickly and more thoroughly than ordinary lavage.

Distortion of the Mesentery is incriminated by Bryant[9] as a cause of intestinal obstruction, from the scalloping of the small bowel thus produced. The condition appears to correspond to some cases of mesosigmoiditis described in 1907 by Ries.[10]

Volvulus associated with Hernia.—Lawford Knaggs called attention in 1900 to the fact that a volvulus of the small bowel was a not very

infrequent accompaniment of strangulated hernia, the volvulus occurring sometimes in the sac, at others within the abdomen. This year[11] he reports four other cases, and J. F. Dobson[12] reports two. *Fig.* 52 (Mr. Knaggs's first case), shows how easily an intra-abdominal volvulus complicating strangulated hernia may be overlooked, and emphasizes the importance of avoiding haste in closing up a herniotomy wound so long as any suspicion of further trouble exists.

Rupture of the Intestine.—Berry and Giuseppi[13] collected from the statistics of ten London hospitals 132 cases of rupture of the intestine following abdominal contusion. This is probably the only large collection of cases drawn exclusively from hospital records, and therefore presents more accurately the actual facts than cases collected solely from the literature. No less than 10 of these cases had been under Mr. Berry's own care. Of the 132 patients, only 10 were females. The injuries were classed thus : Run over 51 ; squeeze or crush, 24 ; blow, 23 ; kick, 16 ; fall, 11 ; reduction of hernia, 1 ; uncertain, 6.

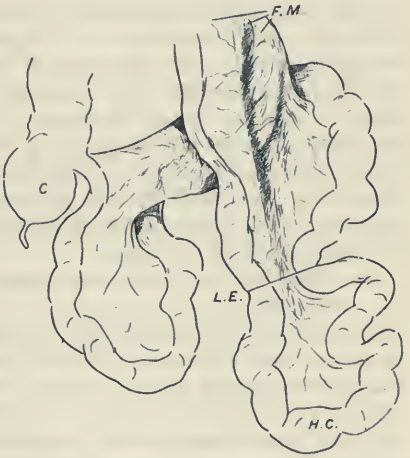


Fig. 52.—Volvulus associated with hernia (Lawford Knaggs). Condition disclosed by necropsy. *C*, Cæcum. *F.M.*, Folds of twisted mesentery. *L.E.*, Left external ring. *H.C.*, Herniated coil.

The large intestine was ruptured in 10 cases, the small in 115 (duodenum 23, duodeno-jejunal flexure 3, jejunum 32, ileum 32, "small intestine" 25), large and small intestine 4, partial rupture of the duodenum 1, and of the large intestine 2. Most of the injuries, they believe, were due to crushing of the bowel against the spine or pelvic bones ; direct traction might be a cause of rupture at the duodeno-jejunal juncture ; but bursting they consider very rare. In 59 cases the symptoms were described with fair accuracy : the most important were early and intense pain ; vomiting, usually repeated ; and rigidity of the abdomen. Dullness, either localized to the region of suspected lesion, or in the flanks, they consider a valuable diagnostic sign. More important, we think, than the subjective or objective symptoms, is the momentum of the vulnerating force ; even a slowly moving mass, if of sufficient size, will cause rupture by a seemingly slight impact. Thus a freight car, a swinging block and tackle, etc., though barely in motion, and apparently coming into mere contact with the abdomen, will be much more apt to cause rupture of the intestine than even a heavy blow from a rapidly moving but light weapon—stick, whip, etc.

Of the 132 patients in this series, 115 died, a mortality of 87 per cent. In the series of 138 cases collected by Hertlé, from scattered reports, the mortality was only 76 per cent, showing the unduly favourable results inferred from such statistics. In the present series 84 patients were treated by operation, with 67 deaths, a mortality of nearly 80 per cent; but in 15 of these cases the rupture was not found at operation, autopsy disclosing it 7 times in the duodenum and 8 times in other portions of the intestinal tract.

Gunshot Wounds of the Intestine.—Sourdat[14] calls particular attention to *multiple* perforations of the intestine by firearms, collecting 70 operations on patients with more than 4 perforations, in 19 of whom more than 10 perforations existed; 21 patients died, a mortality of 30 per cent; in only one case did the autopsy show that a perforation had been overlooked. These facts show that the surgeon should not be discouraged by the extent of the lesions.

Doche[15] has studied anew the question of gunshot wounds of the abdomen during war, as distinct from those observed in civil life. He concludes that the army surgeon is confronted on the field of battle with one of these three situations: (1) The patient has been wounded by a projectile at the usual firing distance, and has no symptoms of internal hæmorrhage; (2) The patient has signs of internal hæmorrhage; (3) The range of fire was within the limits of the explosive zone, and the state of shock and general symptoms clearly indicate the seriousness of the lesion.

He urges that no operation should be done on the field of battle, as practically all such operations are fatal, and patients treated by abstention have a fair chance of recovery—from numerous statistics he shows that abstention allows 50 to 55 per cent to recover, while if operation is done, 95 per cent die. But in the case of death threatening from internal hæmorrhage, or in the case of patients wounded in the "explosive zone," death is practically certain if no operation is done, and operation is therefore permissible if the number of wounded is small, and the facilities rigorously satisfactory. To obtain these facilities, he proposes (1) The establishment before the battle, at a distance of 6 or 8 kilometres, of a special field hospital for abdominal wounds, with a trained service at the hospital, and motor ambulances to transport these patients from the field of battle. (2) Red Cross ambulances with experienced surgeons from hospitals. (3) Railway cars equipped as operating-rooms, with all the accessories of hospitals. At a later date some of the patients in the first class, treated at first by *abstention* from operation, may develop localized suppuration or intestinal obstruction, and some means such as the above must be provided to treat them, as under the latter conditions they may imperatively demand laparotomy.

Vesico-intestinal Fistulæ.—To the 346 cases of this condition published in 1900 by Pascal, Parham and Hume[16] have added 39 others, including 2 original, making a total recorded to date of 385 cases. Over a third of the cases are caused by some intestinal lesion,

usually inflammatory, tuberculous, or malignant. The clinical course is much the same in all cases; following the symptoms of the causative disease, those of fæces and gas discharging from the bladder develop suddenly, usually without premonitory signs. Cystitis is the rule, and ascending infection of the kidneys was present in 18 out of 25 cases examined at autopsy. The average duration of life in 81 cases, according to Pascal, was three years. The best treatment, of course, is separation of the anastomosis and suture of each orifice separately, by laparotomy; intestinal exclusion, partial or complete, has also been adopted, as has colostomy when the fistula is lower in the intestine. Unfortunately the authors have not analyzed the operations employed, so that their relative merits cannot be expressed in percentages.

Surgery of the Sigmoid Colon.—This is yearly assuming a more important place in surgical literature. Bloodgood[17] writes of adhesions and redundancy of the sigmoid, predisposing to *volvulus*, and relates several cases, in one of which resection of the redundant loop was done, and in the others the adhesions were released. Clark[18] has also observed cases of *redundant sigmoid*, causing obstinate constipation; and has in a number of patients secured relief of the symptoms by resection. He notes, however, that a major operation of this kind should be undertaken only for well-defined cause, and not regarded as a panacea for chronic constipation. Usually the thickened and tender sigmoid can be palpated in the left iliac region, and recurrent attacks of sub-acute obstruction are not unusual. Suspension of the sigmoid to the brim of the pelvis has in some patients sufficed to bring relief.

Surgical Treatment of Constipation.—The treatment of a *symptom*, instead of the pathological lesion by which the symptom is caused, is always an unsatisfactory procedure; but so long as measures adopted empirically bring the desired relief, it is difficult altogether to condemn progress along such lines. **Ileo-sigmoidostomy,** adopted in 1900 by Mansell Moullin, has been employed by him since that date in no less than six other patients with chronic constipation.[19] He does a simple lateral anastomosis, without exclusion of the cæcum, and has secured lasting relief, if not absolute cure, in all his patients.

W. Arbuthnot Lane[20] has attempted to elucidate the pathology of chronic intestinal stasis, and speaks encouragingly of the benefits to be derived, when all other means fail, from surgical intervention, comprising in the simplest cases separation of adhesions, and in others ileo-sigmoidostomy, resection of the sigmoid, or even the removal of the entire large intestine.

Diverticulitis of the Sigmoid.—Brewer[21] reports an operation done by his assistant, Dr. Carleton P. Flint, for acute diverticulitis of the sigmoid in a patient on whom Brewer himself had previously operated for inflammation of another sigmoid diverticulum. From his experience with such cases, Brewer groups them into four classes: (1) Mild inflammation, subsiding with rest and medication; (2) Cases of severe grade, in which operation is done before perforation occurs;

(3) Abscess from perforation ; (4) Diffuse peritonitis from perforation. "In general it may be stated that the symptoms and signs of acute diverticulitis are practically identical with those of acute appendicitis in its various forms, the only difference being that the former occurs as a rule on the left rather than on the right side of the abdomen." The treatment should be the same as for appendicitis.

Colitis.—F. C. Wallis[22] urges earlier surgical intervention in all cases of subacute or chronic ulcerative and hæmorrhagic colitis, as well as in acute hæmorrhagic colitis, for he regards these as surgical emergencies. **Appendicostomy** he considers the most satisfactory operation, and thinks that in rebellious cases the opening should be maintained for upwards of a year, in order that the irrigations, which usually may be discontinued in about six weeks, may be resumed

Fig. 53.—Cysts of the Mesentery (H. C. Deaver).

if the diarrhœal discharges recur. In regard to syphilitic ulceration as a cause of colitis, he states that after nearly twenty years of general hospital work, and twelve at a special hospital, in addition to general surgery, he is quite ignorant of this form of ulceration, having never seen a single case of it. This view is, we believe, shared by all those surgeons most competent to judge.

Heaton[23] also writes of his experience with the surgical treatment of colitis ; he has found appendicostomy most satisfactory (*see* APPENDICOSTOMY).

Congenital Mesenteric Cysts.—H. C. Deaver[24] reports a case of this rare condition (*Fig.* 53). He agrees with Moynihan, Dowd, and Niosi in ascribing the origin of most such cysts to sequestered portions of embryonic structures such as the Wolffian or Müllerian organs or

ducts. There are records of 184 cases of mesenteric cysts. Unless they cause obstruction, intussusception, or become adherent to other structures, they seldom produce marked symptoms. When a tumour is palpable, it is much more movable transversely than in a longitudinal direction. The tumour is dull, but surrounded by a tympanitic area. The prognosis is good if the cysts are reasonably small, and if operation is undertaken before symptoms of obstruction arise. If left alone, obstruction is almost certain to recur. "There are four ways of dealing with intramesenteric cysts: (1) Aspiration; (2) Cystostomy and drainage, with or without the use of caustics; (3) Enucleation; (4) Resection of the involved intestinal segment. The first method was followed by recurrence in over fifty per cent of cases, and is now obsolete. The second method, first employed by Sir Spencer Wells, is useful in the presence of numerous adhesions, to dissever which might impair the nutrition of the intestinal wall, or in an emergency. The third method is considered by many ideal, and is ideal when practicable. The fourth I recommend in multiple, juxtaposed cysts, when it is deemed that too much surgical interference, as from dealing with the cysts one by one, carries more risk than simple resection."

Chyle Cysts of the Mesentery.—Brinsmade[25] reports two such cases, and tabulates 44, including his own. They are not true cysts, but probably due to inflammation or degeneration of mesenteric lymph-nodes or vessels. Operation was done in 35 of these cases: extirpation in 15, with 5 deaths; incision and drainage in 18, with no deaths; and puncture in 2, with no deaths. The cysts may cause obstruction, and operation usually is undertaken as an emergency procedure.

Gas Cysts of the Intestine.—Finney[26] reports an operation on a patient afflicted with this rare and curious disease, and collects 18 other cases of the same affection. There are three theories of its cause: (1) That it is a new growth; (2) That it is due to gas-forming bacteria; (3) That it is purely mechanical. No one of these theories is altogether probable. The diagnosis is usually made at operation undertaken for some other condition, and treatment consists either in letting the cysts alone, in rupturing a few of the larger, or even in excising the affected loop of bowel; but the latter procedure is scarcely ever advisable, as the cysts seem to be productive of no particular symptoms. Sometimes at a subsequent operation they are found to have disappeared spontaneously.

Invagination of Meckel's Diverticulum.—This has been studied by H. Tyrrell Gray,[27] who collected 40 cases, including one of his own. Usually the condition leads up to the production of an ileocolic intussusception; in only 7 cases was the diverticulum alone invaginated. It is rare for Meckel's diverticulum to lie free in the abdominal cavity, and as it can only become invaginated when unattached at its tip, the rarity of this condition is readily explained. The usual age for intestinal intussusception is under two years, but only 2 of these cases of invagination of Meckel's diverticulum occurred under the age of two years; 76 per cent of the cases were in males.

The presence of Meckel's diverticulum may often be suspected, according to Gray, by observing the abnormality of the umbilical cicatrix. The usual history is of recurring cramps and colic, often accompanied by tenesmus, with the passage of blood and mucus. Operation was undertaken in 27 cases: resection of intestine in 15 cases, with a mortality of 53 per cent; removal of the diverticulum alone in 5 cases, with 2 deaths; reduction of the invagination without resection in 4 cases, with 1 death; entero-anastomosis above and below the obstruction, in 2 cases, both fatal.

REFERENCES.—[1]*Lancet*, May 1, 1909; [2]*Clin. Jour.* July 21, 1909; [3]*Lancet*, Oct. 3, 1908; [4]*Ann. Surg.* July, 1909; [5]*Arch. f. klin. Chir.* lxxxvi. Hft. 1, in *Ther. Gaz.* Nov. 15, 1908; [6]*Ann. Surg.* May, 1909; [7]*Brit. Med. Jour.* Mar. 13, 1909; [8]*Amer. Jour. Med. Sci.* May, 1909; [9]*Ann. Surg.* July, 1909; [10]*Amer. Jour. Obst.* 1907, lv. 623; [11]*Lancet*, Mar. 6, 1909; [12]*Ibid.*; [13]*Ibid.* Oct. 17, 1908; [14]*Rev. de Chir.* Dec. 1908; [15]*Ibid.* Aug. 1909; [16]*Ann. Surg.* July, 1909; [17]*Ann. Surg.* Feb. 1909; [18]*Ther. Gaz.* Apr. 15, 1909; [19]*Lancet*, Jan. 16, 1909; [20]*Ann. Surg.* July, 1909; [21]*Jour. Amer. Med. Assoc.* Aug. 15, 1908; [22]*Brit. Med. Jour.* Jan. 2, 1909; [23]*Lancet*, June 12, 1909; [24]*Ann. Surg.* May, 1909; [25]*Ibid.* Oct. 1908; [26]*Jour. Amer. Med. Assoc.* Nov. 17, 1908; [27]*Ann. Surg.* Dec. 1908.

IRIS, DISEASES OF. *A. Hugh Thompson, M.D.*

The cause of iridocyclitis is often to be looked for in some more or less distant part of the body. In a lecture on metastatic inflammations of the eye, Parsons[1] discusses the nature of the infective process. Some cases are due to a septic condition of the mouth, especially to pyorrhœa alveolaris; in other cases the nasal sinuses, in women some septic condition of the generative organs, may be the cause. Perhaps most commonly the intestinal tract is at the root of the mischief. The theory that best suits these cases is that of metastatic inflammation, either by bacterial invasion or by the circulation of free toxins. The part acted on is the epithelium of the processes of the ciliary body. In irido-cyclitis the aqueous which is secreted is highly albuminous, which shows that the epithelium lining the secreting surface must have received injury. In the case of sympathetic iridocyclitis the bacteria may develop and become encapsuled in the exciting eye. When they do enter the blood-stream, they are harmless except to one particular tissue, namely the ciliary processes of the other eye. This theory of metastatic inflammation would explain the good effect of enucleation of the exciting eye and the importance of doing it early in cases of sympathetic iridocyclitis. In all cases of metastatic inflammation the essential point in treatment is to find out the source of the mischief and attack it. The symptom which is most characteristic of metastatic irido-cyclitis is that usually known as "keratitis punctata," or "K.P.," not really an inflammation of the cornea at all, but little lumps of fibrin deposited on the posterior surface of the cornea from the aqueous, and often needing a corneal magnifier to detect.

Iridotomy.—This operation, the object of which is to create an artificial pupil in cases where iritis following cataract extraction has destroyed the natural one, is very old. It is performed either with

a knife-needle or with scissors. The disadvantage of scissors is that they can only be introduced after a preliminary incision. The aqueous having escaped, there is a considerable danger of loss of vitreous. With a knife-needle, on the other hand, it is difficult to make a sufficiently large incision, and a small one is very liable to close up. Ziegler[2] adopts the following method. He uses a knife-needle with a falciform point and a straight cutting edge 7 mm. long. The shank is constructed on the principle of all modern needles, i.e., it must accurately fit the hole made by the blade, so that no aqueous can escape. The knife-needle having been introduced subconjunctivally, the operation consists in two incisions into the iris converging above. The millimetre scale shows that the knife is first entered at a point 3 mm. to the right of the vertical meridian. On the

Fig. 54.—Ziegler's V-shaped method. Plan of first incision.

Fig. 55.—First incision completed. Plan of second incision.

Fig. 56.—Pupil resulting from V-shaped iridotomy.

completion of the first incision, the larger part of the iris bulges to the left, so for the second incision the knife is entered 4 mm. to the left, and to make sure of dividing all the fibres it is completed slightly below the apex. On the completion of the second incision the flap between them retracts, leaving a triangular pupil. (See *Figs.* 54–56).

REFERENCES.—[1]*Brist. Med.-Chir. Jour.* Mar. 1909; [2]*Jour. Amer. Med. Assoc.* Feb. 13, 1909.

ITCHING.

(*Vol.* 1909, p. 389)—For the itching of eczema and lichen planus Boeck's solution is recommended: R Talci, Pulv. Amyli, Liq. Plumbi Subacet. dil. āā 100; Sol. Acidi Borici in aqua (1 per cent) 100; Glycerini, 40; Aq. Camphoræ, 250.

JAUNDICE, FAMILY. *Robt. Hutchison, M.D.*

This is also known as congenital family cholæmia, a rare and interesting disease, first described by French writers, but cases have recently been published in this country by Hawkins and Dudgeon,[1] and Hutchison and Panton.[2] The main features of the disease are easily indicated: (1) It is characterized by the presence of jaundice. (2) The jaundice is usually congenital. (3) It runs in families, occurring in successive generations and often in several members of the same generation. (4) There is enlargement of the spleen and sometimes of the liver also. (5) The blood shows marked changes, there being a diminution of the red cells and hæmoglobin, and the presence of nucleated red cells, both normoblasts and megaloblasts. (6) Bile-pigment is present in the serum, but is usually absent from the urine, which, however, exhibits the presence of urobilin in excess.

As regards the pathology of the condition, it has been shown in all the cases that the red blood corpuscles are unusually fragile, and the most probable explanation of the symptoms is that the red corpuscles are broken down in excess and give rise to a "hæmatogenous" jaundice. Why the bile pigment does not escape into the urine has not been satisfactorily elucidated. The disease is essentially, therefore, a blood disorder, or a congenital anomaly of the red blood corpuscles which is transmitted by inheritance. The blood changes (anæmia with the presence of nucleated corpuscles) are due partly to the great destruction of red cells which is always going on, and partly to an attempt on the part of the bone marrow to compensate for this by throwing immature red cells into the circulation.

The prognosis is favourable as regards life, some of the affected individuals having lived to an advanced age, but the disorder is essentially incurable, and no treatment has any effect upon it.

REFERENCES.—[1]*Quart. Jour. of Med.* 1909, ii. p. 165; [2]*Ibid.* 1909, p. 432, and *Clin. Jour.* July 28, 1909.

JAW, CANCER OF. (*See* CHEEK AND JAW.)

JOINTS, RESULTS OF INJURIES. *Priestley Leech, M.D., F.R.C.S.*

Richard Warren[1] has performed a very useful task in enquiring into the end-results of damaged joints; the material was furnished by 400 cases taken for a period of about eighteen months in the massage department of the London Hospital. The investigation was confined to injuries affecting the shoulder, elbow, wrist, and ankle. He says it is not always easy to define when function is properly restored; the surgeon is often surprised by the inability to perform heavy work on the part of a patient whose limb on examination appears to have complete mobility and strength. Malingering is often suspected, and sometimes rightly; but the fact must not be lost sight of that in many walks of life a fitness and efficiency are required such as is possessed by a trained athlete. We are all aware what a comparatively slight strain of muscle or joint will put us completely off our stroke at any game, so it is not difficult to believe that men whose business it is to climb unstable ladders, sling about hundredweight bales, or get round amongst whirling machinery, may be incapacitated by small defects of which there are no signs in the consulting-room. In patients over forty years of age the functions of joints, tendons, muscles, nerves, and vessels must be looked to rather than an exact return of the bone to its anatomical structure and shape.

The Ankle.—Under this heading are classified sprained ankle, fractured lower end of the fibula, Pott's and Dupuytren's fractures, fractured internal malleolus, and separated epiphyses. Another class allied to these is stiff ankle with foot-drop and contracted tendo Achillis following on fractures of the tibia and fibula in their middle and lower third, a result of failure to keep the foot at right angles

Pott's Fracture.—Thirty-four recent cases came under notice. Of these 8 gave a very good result, 13 good, 10 fair, and 1 bad. The

time these cases were under treatment varied from three to seven months. The following conditions were found to increase the length of treatment necessary: (1) Œdema of the ankle and leg, due no doubt to the thrombosis of veins and lymphatics of varying extent; its frequent occurrence and great persistence is a plea for early massage in these cases; (2) Long splinting; (3) Severity of the original injury; (4) Compound fracture; (5) Debility.

Fractured Fibula.—In 17 cases of fracture of the lower end of the fibula treated, 1 case was lost sight of, and the results in the remaining 16 were: 7 very good, 6 good, and 3 fair. The length of treatment varied from five to twelve weeks.

Fracture of Internal Malleolus.—Three cases were seen; 2 gave good results, 1 was not traced. The length of treatment varied from six to twelve weeks.

Sprained Ankle.—Of 9 cases, 5 gave perfect results; 4 were only fair, the patient being troubled with varying degrees of flat-foot. Treatment, a month or less; in some cases several months' treatment were necessary; in one case as many as five. The results are very fair, but a considerable time was expended in treatment.

The treatment varied according to the views of the house surgeon. As a rule an L-shaped back splint with side splints, or lateral L splint was used, and in three or four weeks a plaster Croft was put on, and massage and movements instituted. Warren recommends the following method in Pott's fracture, fractures of the internal malleolus, and some cases of fractures of the lower end of the fibula where there is reason to think that the internal lateral ligament has been sprained. Bearing in mind the troubles which arise from imperfectly conducted treatment, viz., everted, splay, or flat foot, and equinus, or both, the foot must be put up in a position of inversion, of dorsiflexion to a right angle, and without backward displacement. The splint which best answers this purpose is the L-shaped external splint with a foot-piece known to Warren as Sharpe's splint, but described in some books as a Roughton. The Sharpe's splint with a small separate splint of about eight inches long, will prevent backward displacement. The following are the points in applying this splint: (1) A good pad is placed on the outer side of the foot below the external malleolus and between the foot and the splint; this inverts the foot and at the same time protects the internal malleolus from pressure. (2) The knee must be very acutely flexed; to act properly, the thigh should be flexed on the belly and the leg on the thigh, thus relaxing as far as possible the tendo Achillis and greatly obviating any tendency to draw back the foot and plantar flexion of the ankle. (3) The bandage is pinned to the hinder edge of the splint before the leg is placed in position behind the ankle; it is then brought forward under the ankle between the latter and the splint, and back again over the ankle and the small separate posterior splint, and so round the whole splint and down over the foot and foot-piece. This arrangement pulls the tibia back, pushes the heel forwards, and usually suffices

to keep the foot in good position. If this plan fail, it is better to cut the tendo Achillis to relax its pull on the heel.

The Wrist.—The most striking feature of this series is the enormous predominance of Colles's fracture : 103 cases out of 110.

Colles's Fracture.—Ninety-one were recent cases, and 12 cases of some standing before treatment was commenced. Twenty-one were not traced ; of the 70 traced the results were very good in 12, good 36, very fair 7, fair 9, and bad 6. In other words, two-thirds of the cases gave useful working results, while 1 case in 12 was hopelessly bad. The conclusions about Colles's fracture are : (1) The time necessary for treatment before function is restored varies with the time the joint is fixed on a splint before massage and movements are instituted. (2) Reduction of the fracture is generally possible to some degree, but seldom entirely. (3) Fixation must be very limited both in amount and duration ; an anterior cane splint acts well ; a posterior splint is injurious to the tendons and ligaments at the back of the wrist, and should not be used ; strapping should on no account be applied, and bandaging should be very light. (4) In cases where deformity is slight and does not tend to increase, good results may be obtained without using splints. (5) A splint helps to prevent deformity, though the latter cannot be completely prevented by a splint ; and excessive deformity may lead to impaired use of the limb. (6) Deformity is best avoided if possible, but stiffness of joints and tendons is a worse evil than deformity. (7) One to two weeks on a splint is sufficient, perhaps in hospital patients a week longer, as they are apt to use their hands too much. (8) Massage and finger movements should be started on the third day at latest ; the wrist can be gently moved at the end of a week. (9) In from two to four weeks, stronger active movements can be indulged in. Flexion and extension combined with gripping are the most useful movements.

The Elbow.—Among the injuries about this joint were the following : Dislocations 9, sprains 11, osteo-arthritis 2, fractured olecranon 18, fractured head and neck of radius 10, separated lower epiphysis of humerus 28, separated internal condyle 13, separated external condyle 10, separated internal and external condyle 1, fractured coronoid 1, T-shaped fracture 1, and supracondylar fracture 5, total 109.

Dislocated Elbow.—All did well in children ; one in an adult which had been kept in plaster many weeks gave no improvement. These cases only need a splint for a day or two, then a sling, and early massage and movement.

Sprained Elbow.—There were 11 cases ; 3 in children did well ; in adults the results are not so good ; two of the men, though doing heavy work as stevedore and locomotive fireman respectively, complained of incomplete extension of the elbow, and in the latter case of inability to throw coal with full power into the fire-box.

Separation of the Lower Epiphysis of the Humerus.—Of 28 cases attended, 70 per cent were under eight years of age. In 20, results were

good, and half were anatomically perfect; in 3 cases decided cubitus varus was found; in 1, cubitus valgus.

Separation of the Internal Condyle.—Thirteen cases; in 10, results good; 2 fair, one of the latter developing symptoms of osteo-arthritis at 16 years of age.

Separation of the External Condyle.—Nine cases; 6 gave good results, but 1 showed excessive callus about the external condyle, with partial dislocation of the head of the radius and impaired power of extension.

Supracondylar Fractures of the Humerus.—Two children, aged 6 years, results good; three adults, 34 to 60 years, only one traced and result fair.

T-*shaped Fracture of the Lower End of the Humerus.*—One patient, 17, was wired and treated by movement; a year later there was a useful joint with slightly impeded flexion and extension.

Fractures of the Upper End of the Radius.—Ten cases seen; in children results good, 2 cases in men only gave fair results. Treatment, sling and massage.

Dislocations of the Shoulder.—Twenty-five cases of recent dislocation, the ages varying from 20 to 70. In 4 there was severe damage to the brachial plexus or some of its cords. Results: 10 good, 5 fair, 1 bad, and 9 not traced. It was very noticeable how prolonged fixing of the shoulder necessitated longer after-treatment. The last movement to recover and the one to remain impaired in those cases which did not perfectly recover, is that of the deltoid. Of *old dislocations* there were 5 cases; 1 did perfectly when seen a month after reduction; of 3 cases not seen for three months after reduction, 1, aged 22, did well; 2, over 60, only gave fair results. In dislocation it is important to find out whether any nerve is injured or not. A sling is sufficient, and massage should be used from the beginning.

Fracture-dislocation of the Shoulder.—Four cases; in 2 the head of the humerus had been excised. The results bear out the conclusions of Scudder and Mason, that operation with replacement of the head of the humerus *in situ* is satisfactory, but that excision of the head gives poor results as a rule, and that the more of the head and neck that is removed the less will be the working capacity of the limb.

Contused Shoulder.—In all 5 cases treated there was great weakness of the deltoid, and in 2 of the cases undoubtedly injury to the fifth cervical root. In 2 the results were good, in 2 fair.

Fractures of the Surgical Neck of the Humerus.—Of 14 cases 7 were good, 5 fair, 1 bad, and 1 was not traced. 60 per cent of the patients were over 50 years of age. The bad result was associated with, and largely due to, an injury of the brachial plexus. Length of treatment, seven to ten weeks.

Fractures of the Anatomical Neck.—Three cases, all over 60; 2 did well and 1 was fair.

Fracture of the Great Tuberosity.—One case; did well after twenty weeks' treatment.

In all these fractures of the upper end of the humerus there is a

tendency to keep the shoulder fixed too long before massage and movements are commenced. Keeping the shoulder fixed for a month is far too long ; movement can be started in seven to ten days.

Fractured Clavicle.—Two cases were attended, and required six to eight months before they were in a satisfactory condition. Too much attention is paid to getting the fragments in good position and consequent tight application of strapping after the manner of Sayre. Fixing of the shoulder, especially in older persons, often results in prolonged stiffness ; pressure of strapping on the arm affects the nerve and blood supply of the forearm, causing œdema, a certain amount of nerve palsy, and a varying slight degree of ischæmic degeneration of muscle which adds to the rigidity of the hand. The hand is kept extended and strapped to the chest, and after three weeks resembles a whale's flipper, a condition likely in the elderly to persist indefinitely. In elderly people the hand should be left free, and the shoulder should be treated with respect and not restricted for long.

REFERENCE.—[1]*Lancet*, July 17 and 24, 1909.

KALA-AZAR. (*See* LEISHMANIASIS.)

KERATITIS. (*See* CORNEA.)

KIDNEY, DISEASES OF. *E. Hurry Fenwick, F.R.C.S.*

Transplantation of Kidney from Dog to Dog.—Among the early attempts at repair of the human frame by transplantation of organs from the animal must be recorded the work by Dr. Ernst Unger,[1] of Berlin. He was able to transplant the entire urinary tract with its vessels from one dog to another. The latter lived eighteen days in apparent health, secreting urine abundantly ; it died suddenly, and the venæ cavæ were found full of clot, but the stitching had held well.

Gangrene of the Kidney from Faulty Operative Technique.—Brewer,[2] of New York, gives an important case that came under his notice, which should be quoted as a gentle warning to those who find themselves forced to perform operations upon the kidney without having had much previous experience of technique. He was summoned to a married woman, aged 40, who had been operated upon by another surgeon. The kidney had been delivered through a lumbar incision, and had been carefully but negatively examined for stone and other lesions in order to account for a two months' history of right-sided renal colic, with vomiting and pyuria. Apparently, the kidney had been replaced in the usual way and anchored by catgut sutures ; but considerable pain followed the operation, with fever, vomiting, and great tenderness. These symptoms increased in severity, and the general condition became alarming. Brewer was summoned, the wound re-opened, and the kidney found to be completely necrotic, evidently from strangulation of the vessels due to a twisting of the pedicle, the kidney having been replaced at the first operation *in an inverted position, with the lower pole uppermost.* The necrotic kidney was removed, and the patient made a satisfactory recovery.

Temporary Exclusion of the Kidney from the Body Cavity (*Extra-parietal Nephrostomy*).—Clay,[3] of Newcastle, has probably introduced a valuable modification of **Nephrostomy** in *very thin* women. Being confronted with a patient whose kidneys were suppurating and packed with stones, he brought the right kidney on to the loin, opened it freely, emptied it of stones, and kept it out on the loin for seven days. The bed from which the kidney had been removed was packed with gauze ; on the seventh day the gauze was removed, and the kidney, which was now covered with healthy granulation, was returned to its place. Two and a half months later the patient had the same operation done on her left side, and was shown at the Durham Medical Society four months later, improved in appearance and expressing herself in every way relieved. Though the plan of keeping the kidney outside the wound was adopted by Clay on the spur of the moment, he considers it diminishes the dangers of attempts to save lacerated or septic kidney, and thinks it is an addition to the conservative surgery of that organ. [It is obvious that such a procedure can only be feasible in cases in which the pedicle of the kidney is long, and would not be stretched unduly by vomiting or other muscular actions, and very probably it will be restricted to thin females.—E. H. F.]

Tuberculous Kidney.—Certain questions of importance are raised in this year's literature concerning this disease. Have we any guide, in the urine drawn from the tuberculous kidney, as to the extent of the destruction due to the disease ? Ehehorn draws certain conclusions from the number of tubercle bacilli which can be found in the urine ; thus, he thinks numerous bacilli may be found in the urine in very early cases, but that the number of bacteria found at different times vary during the different periods of the disease. When a new part becomes involved, the bacteria are more numerous. With many bacilli there may be a small quantity of pus, while with a large amount of pus the bacteria may be relatively few in number. When the pus is in large quantity and the bacteria are few, the lesion is probably an old one, with cavities and sclerotic walls. If the pus in the urine is insignificant, then it is probable that no very large part of the kidney is involved, although many bacilli may be present.

Regarding the etiology of the thick ureter so often felt in urinary tubercle, Aschoff thinks that the involvement of the walls of the ureter is an ascending lesion, secondary to the ulcer in the bladder, the infection spreading upwards through the lymphatics from the ulcer at the ureteral opening in the bladder ; the ulcer itself being a descending lesion.

What may be the duration of a tuberculosis of the kidney ? Czerny-Simons states that it may exist ten to fifteen years. The collator has known one to exist eighteen years.

What is the present recognized treatment ? Armstrong[4] sums up his experience as follows : The prognosis in renal tuberculosis is very bad when not relieved by operative measures. It would seem that **Nephrectomy** is the safer and more conservative plan. As to partial

nephrectomy, a careful examination of the kidneys removed has seemed to demonstrate that such an attempt must necessarily prove uncertain and unsatisfactory. The difficulty of locating the disease and removing it altogether, even after complete longitudinal splitting of the kidney, seems to us to be insurmountable, and the literature contains many cases of this so-called conservative surgery of the kidney which have resulted in permanent fistulæ and subsequent nephrectomy. Bilateral disease, colic, hæmorrhage, retention, or localized abscess, are the conditions which Czerny and Israel consider to call for nephrotomy. These conditions demand a palliative operation. When one kidney is in a condition of pyonephrosis, but still secreting a urine of sp. gr. 1007 and 1008, while the other kidney secretes urine of the sp. gr. of 1010 or 1012, it is impossible to sacrifice any secreting tissue without imperilling the proper consistency of the blood. In such cases **Nephrotomy** is justifiable. In undertaking nephrotomy under these circumstances, one must be prepared to put up with the annoyance of a persistent sinus through which more or less purulent urine may pass. In general, nephrectomy is the operation of choice if the disease is limited to one kidney, and is advisable, not only to relieve the patient from that focus of disease, but to relieve the good kidney from the extra work entailed by the diseased kidney. The contraindications are, absence or imperfect functional power of the opposite kidney, evidence of incipient disease of the other kidney, as indicated by the presence of albumin, a few pus-cells, with tubercle or other bacilli. Cases are reported in which, after the diseased kidney has been removed, the other has improved, the albumin and pus-cells in some cases having disappeared altogether.

How are we to treat the stump of the ureter in nephrectomy for tubercle ? Mayo suggests injecting the distal end of the ureter with 20 min. of pure carbolic acid, and then tying it. Others advocate tying up the ureter and attaching it to the lower end of the incision. The whole question turns on whether there is acute or chronic ureteritis. Any treatment suffices for the chronic, but the acute ureteritis will always cause infection in the wound.

Cancer of the Kidney.—Rovsing considers the two important steps in the technique of nephrectomy for carcinoma of the kidney to be : (1) The isolation and double ligature of the ureter, which is then severed with the thermo-cautery between the ligatures, and its stump fixed upon the outside of the skin by a silk suture. This prevents escape of cancerous débris, from retraction of the stump and subsequent infection of the retro-peritoneal tissues, with local recurrence. (2) The kidney and its tumour should be enucleated without tearing the capsule or pelvis—as a closed mass. Legueu advocates the incision of Grégoire for thorough removal of the glands in nephrectomy for cancer of the kidney.

Movable Kidney.—The anterior incision for approaching the kidney, which was advocated originally by Harlan, of Cincinnati, Ohio, in 1905, and independently by F. Stanmore Bishop in 1907 (*vide Medical*

Annual, 1908), is being viewed with favour. It certainly allows of a more accurate replacement of the prolapsed organ. Watson Cheyne,[5] using a slightly different incision, approaches the kidney anteriorly, and uses the capsule reflected from the back of the kidney from the lower and outer areas to fix the organ to the muscles, by which modification he claims good results.

He agrees that the cases which require operation are those in which harm is being done by the pedicle frequently becoming kinked, or where the condition of intermittent hydronephrosis has set in, or where there is injurious pressure on the duodenum or common bile-duct. Certain cases are also suitable for operation where the symptoms are less severe, but where they mainly consist of pain in the back when the patient is in the upright position, provided they

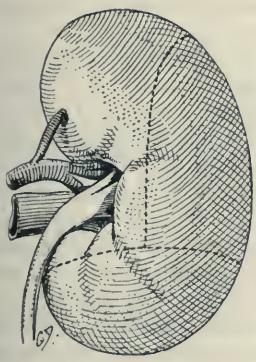


Fig. 57.—Incision in kidney capsule on posterior surface of the organ.

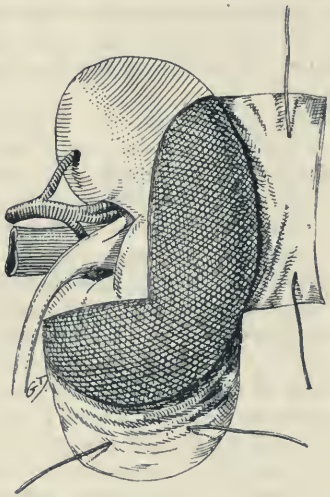


Fig. 58.—Capsule stripped from kidney.

are not associated with enteroptosis. There are two classes of case, on the other hand, in which the question of operation is (to say the least) doubtful: (1) Movable kidney associated with a greater or less degree of enteroptosis. Where this is marked, the fixation of the kidney is not likely to produce much or any benefit unless it is accompanied or followed by some attempt to raise the other organs which have also dropped, and that means important operations, the extent of which is by no means certain. Hence, in such cases it seems the most prudent course to see what amount of benefit can be obtained by properly constructed and fitted corsets and pads before considering the question of operation. (2) The other class is where the condition is accompanied by marked neurasthenia. The general experience is that in these cases not only may no benefit result, but the state of

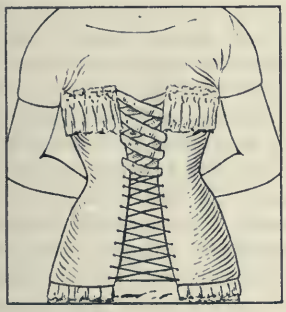
the patient may be rendered worse. The following is the technique of the anterior **Nephropexy** operation practised by Watson Cheyne: The patient lies on her back with a small pillow under the loins. A four-inch incision is made along the edge of the ribs and an inch below them, beginning just at the point where, looking down on the patient, the anterior surface of the abdomen ends. Skin, fascia, and external oblique are divided, the fibres of the internal oblique and transversalis are separated, the peritoneum is pushed to the middle line, carrying the kidney with it, until one sees the posterior surface of the kidney, covered by the perirenal fascia. An incision is made into this latter, and the kidney brought out, denuded of its fat and adhesions, turned over, and its pelvis examined for stone, or for kinking or vessel-throttling of the ureter. Finally, the capsule is divided so as to make flaps of this structure, for stitching to the muscles (*Figs.* 57, 58). The kidney is replaced in its proper position, and fixed by attaching the capsular wings to their appropriate area in the adjoining muscle. A glance at the diagrams will make this latter manœuvre clear.

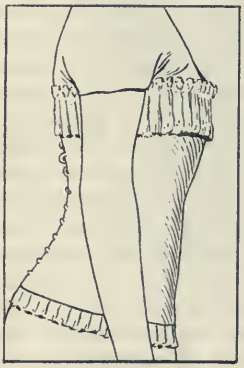
McLaurin,[6] of Sydney, apparently makes a ledge for the kidney to rest on. He writes as follows: The operation which I now do is simply the formation of a shelf beneath the viscus. An incision is made from the tip of the 12th rib downwards and forwards, which is deepened by muscle-splitting; the peritoneum is pushed forwards; the canary-yellow fatty capsule of the kidney is stripped off and removed from its attachment around the hilum; the kidney is brought to the surface, split up the middle, and examined; if found normal, sewn up again; the peritoneum and Zückerkandl's fascia are sewn to the fascia, covering the quadratus lumborum with interrupted sutures of chromic gut, and the wound closed. There is practically no pain or reaction, which is a great improvement on the vomiting and shock which followed the older methods, and so far as I can see at present, the results are quite as good.

Garland,[7] from a very extensive experience of visceral ptoses, divides his cases thus: (1) The movable kidney was in many instances productive of no demonstrable symptoms; (2) The cases proved to be a prolapsed right kidney, compressed by the corsets or waistbands, manifested by Dietl's crises; (3) Intermittent descent of the right kidney, inducing hydronephrosis; (4) Slight descent of a chronically congested right kidney, dragging on or compressing the bile-ducts, causing acute jaundice; and (5) Acute traumatic dislocation of the kidney, most frequently the left, associated with hæmaturia. He maintains that 90 to 95 per cent of symptomatic movable kidneys can be cured symptomatically by wearing a **Corset.** If it is permissible, says Garland, to judge by subsequent experience and by the number of cases in which fixation has failed to fix or relieve the symptoms, not more than 1 per cent require operation. He submits that a corset laced tightly at the waist-line would readily support a replaceable kidney, and would put a stop to such symptoms as were actually due

to kidney mobility, better than operation. It is quite evident that the more grave and detrimental chronic gastro-intestinal displacement and symptoms which often accompany movable kidney, and which are due to visceral ptoses other than that of the kidney, were not relieved, but made decidedly worse, by the indispensable additional tightening of the corset at the waist-line. In other words, by the use of a corset laced tightly at the waist we were enabled to determine and relieve kidney symptoms, viz., Dietl's crises, hydronephrosis, jaundice, and hæmaturia, but it intensified the gastritis, constipation, malnutrition, etc., of enteroptotic origin.

Garland, therefore, advises a corset (*Figs.* 59, 60), at the bottom of which the front steels must overlap the upper half-inch of the symphysis pubis; it must reach down low and fit very snugly around the hips, stretching very tightly across from one anterior superior spine to the other, to flatten and reduce the hypogastrium to a





Figs. 59 *and* 60.—Corset for Movable Kidney. The upper portion is laced with loose elastic.

minimum. To prevent constriction, the circumference must equal that of the natural waist; at the same time there must be a well-marked incurving of the sides at the waist, in order to support the kidney, to prevent the corset slipping upward, and to afford a fashionable outline to the figure. At the back and sides the upper portion must accurately fit the thorax, while in front ample room must be provided for the replaced stomach, as any pressure on the epigastrium would induce unbearable pain and discomfort. Below the waist the corset must be inelastic and inflexible, that the replaced viscera may not descend after the corset has been put on; yet, on the other hand, all that portion above the waist must permit free play to every motion of the trunk, afford unconfined action to the thoracic walls, and in no way interfere with the action of the heart and the full expansion of the lungs. It must, of course, be put on lying down, with the legs flexed at a right angle, and before adjusting, the abdomen should be massaged, stroking upwards for ten minutes, thereby assisting the

displaced organs to gravitate towards the diaphragm. The replaced stomach should be noticeably prominent within the upper portion of the corset, and cause a distinct bulging of the epigastrium.

REFERENCES,—[1]*Berl. Klin. Woch.* June 7, 1909; [2]*Med. Rec.* Mar. 20, 1909; [3]*Brit. Med. Jour.* May, 1909; [4]*Ann. Surg* July, 1908; [5]*Lancet*, Apr. 24, 1909; [6]*Austral. Med. Gaz.* Sept. 1908; [7]*Jour. Amer. Med. Assoc.* Nov. 1908.

KNEE JOINT, DISEASES OF. *Priestley Leech, M.D., F.R.C.S.*

A. Barker[1] says so-called "derangement" of the knee joint is more treated than formerly, whether it is more common or not. It occurs at all ages and at all times of life except at its two extremities. Besides a loose semilunar cartilage, there are several conditions in the knee joint which may produce symptoms closely resembling those due to displacement of the meniscus: (1) True loose bodies, cartilaginous, bony, or fibrous, detached and floating about into any part of the cavity; (2) More or less pendulous fringes or tags of hypertrophied synovial membrane, long enough to become engaged between the bones; (3) Rheumatic nodules or lips on the borders of the bones, which interfere with the smooth working of the ligaments and capsule, giving rise to milder pinchings or lockings as the capsular structures play over them. It is essential to make a diagnosis between these conditions, but it is not always possible, and the greatest difficulty is to diagnose between the symptoms of detached semilunar cartilage and the attached fringe or fibrous tag of synovial membrane found occasionally in joints which have been wrenched or otherwise injured, and have as a consequence been the seat of subacute or chronic synovitis with hyperplasia of the lining membrane. In these cases, if the semilunar cartilage is found normal on opening the joint, the surgeon may close the wound without relieving the patient, to his own and the patient's disappointment. In Barker's experience, the relief after operation, if properly done, has been complete. He uses a curved incision, commencing over the ligamentum patellæ and sweeping slightly downwards and outwards to end over the internal lateral ligament; the lowest point lies about half an inch below the articular border of the head of the tibia; a second stroke of the knife should deepen this cut to the bone, dividing the expansion of the capsule and the periosteum. With an elevator the periosteum is stripped upwards from the bone until the edge of the articular cartilage is bare, and the joint is opened under the usual situation of the semilunar cartilage. On flexion of the knee and rotation outwards of the tibia, any detachment or tearing of the cartilage can be seen. If the anterior portion was only separated, it was formerly advised to stitch it to the capsule; but it is better to remove it; the meniscus may at first sight seem normal, but on pulling on it with a sharp hook it will be seen in some cases to have become detached posteriorly. If the internal meniscus is normal, it may be the external which is loose and has given rise to the symptoms. Two weeks after operation the limb may be moved, and in three weeks gentle walking should be encouraged.

Rutherford Morison[2] says that the lesion in internal derangement

of the knee joint is not detachment of the semilunar cartilage, but fracture; the cartilage is loose because it is fractured. In an active man who wishes to follow an active life, operation is necessary, but Morison says the danger is many times more serious than the ordinary abdominal operation, and sepsis occurs more frequently than is supposed. He uses a tourniquet on the thigh; the knee is flexed, and an incision (as in *Fig.* 61) is made through the skin only; a fresh knife is taken to make the incision through the extensor aponeurosis from the upper part of the skin incision straight over the head of the tibia. In simple cases this suffices, but in more difficult ones the incision is curved backwards over the inner part of the head of the tibia, but never divides the ligamentous structures on the inner side of the joint beyond the skin incision. On dividing the strong extensor aponeurosis a thick pad of tough fat is exposed, and this is drawn forwards and divided between two clip forceps until the joint is opened.

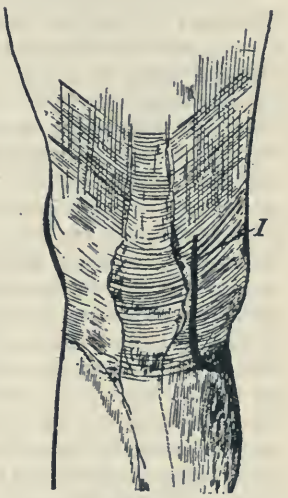


Fig. 61.—Morison's Operation for internal derangement of Knee Joint. —*I* Incision.

C. B. Lockwood[3] says inflamed and enlarged synovial fringes are as a rule mistaken for some fault in the fibrocartilages or for a loose body within the joint. The pain and tenderness of inflamed alarial fringes are usually felt close to the edge of the ligamentum patellæ. As regards the causes of inflammatory enlargements of the synovial fringes, traumatism should be placed first. The fringes are nipped, blood is effused into them, this clots, and then inflammation occurs. Lockwood also draws attention to the pad of Malgaigne; these are small adipose pads immediately above the articular surface of the femur and on either side of the upper end of the patella. They are often mistaken for loose bodies, but they always remain in the same situation. In three cases he has been deceived by inflammatory enlargements of the pads of Malgaigne. He advises no surgeon to minimize the dangers of arthrotomy.

REFERENCES.—[1]*Pract.* Mar. 1909; [2]*Lancet*, Feb. 27, 1909; [3]*Brit. Med. Jour.* July 3, 1909.

LABOUR. *Victor Bonney, M.S., M.D., F.R.C.S.*

Contracted Pelvis.—At the meeting of the British Medical Association, Fehling,[1] of Strasburg, opened a discussion on the treatment of contracted pelvis. He described the various methods under three heads: (1) Dietetic measures; (2) Induction of premature labour; and (3) Operative procedures. In regard to **Diet,** he supported the possibility of reducing the size of the fœtal head by the adoption of

Prochownik's method of feeding during the last six or eight weeks of pregnancy, but remarked that further corroboration of its effects was yet needed.

Concerning **Induction,** he considered that it should be undertaken only in cases of multiparæ. In primiparæ with contracted pelves one should first observe the course of spontaneous birth. The process also takes much longer in these patients, and the outlook as regards the child is not so good. In his clinic, 76·46 per cent of the children thus born were discharged from the hospital alive. He asserts that the number of children living at the end of a year is greater in those born by induction than by Cæsarean section.

In regard to operative procedures, he believes that in hospitals **Pubiotomy** is the best practice in cases suitable for its performance; that is, where the true conjugate diameter is not less than 7·5 cm. The operation, however, is not for private practice unless expert aid be available. In such cases the high forceps operation should be tried, and this failing, perforation of the head should be resorted to. By pubiotomy perforation is avoided. The one important point is that the child should be in good condition. He recommends Bumm's subcutaneous operation. The special needle recommended by him is made to pierce the skin under the control of one hand in the vagina, at the lower edge of the pubis, and is then pushed upwards (when possible under the periosteum) until the skin above the pubis and somewhat to the outer side of the tubercle is reached. A small incision is then made down on to the needle point, the point pushed through this, the saw attached to it and drawn back in the same course. If up to this time severe bleeding has been avoided, it is not likely to occur from the sawing. As soon as the bone gapes enough—this can be best controlled from the vagina—the saw is withdrawn, and the subcutaneous wound is at once compressed from outside and from the vagina with gauze to prevent the production of a hæmatoma. Zweifel's advice to await spontaneous birth should now be followed, and lacerations of the soft parts thus avoided. If, however, the child shows signs of danger, forceps must be applied or version performed.

Fehling, in thirty-two cases, lost one mother and four children, and he thinks the operation compares more than favourably with Cæsarean section under the same circumstances. Speaking of this latter operation, he remarked that since the introduction of pubiotomy its limits had been narrowed in hospital practice. He chiefly reserves it for cases in which the C.V. is less than 7·5 cm.

Relative Cæsarean Section, i.e., when an alternative method of delivery is available, is in his opinion not the proper operation for unmarried primiparæ, for infected cases, and when the child is dead. He believes that the classical Cæsarean section through the upper uterine segment will be in future replaced by incision through the supravaginal cervix, but he sees no advantage in the various methods of performing the operation by a subperitoneal route.

Schautar[2] says that the indication for induction of premature labour

is a true conjugate diameter of 7½ to 8½ cm. in flat pelves, and one between 8 and 9 cm. in generally contracted pelves. He would limit its practice to cases of multiparæ who are known to have given birth to large children with well-developed heads, and which are therefore capable of surviving. From the social point of view he holds that it cannot be the task of the obstetrician to put into the world premature and weakly children. He believes strongly in leaving cases of labour with slight or moderate contraction of the pelvis to nature, as long as possible with due regard to the condition of the mother. Many, thus left, eventually end in spontaneous delivery.

In cases with a conjugate above 5 cm. there is a possibility of spontaneous birth, and expectant treatment should at first be adopted. Pubiotomy is to be considered in a conjugate between 8½ cm. and 8 cm. as an alternative to spontaneous delivery; and between 8 cm. and 7½ cm. as an alternative to Cæsarean section. The application of forceps above the brim should be resorted to as a last chance before undertaking perforation of the head of the living child in cases where neither pubiotomy nor Cæsarean section is proper or, under the special circumstances, possible. Version is an alternative resort under similar circumstances. Schautar regards pubiotomy and Cæsarean section as operations well within the capability of any practitioner.

Comparing pubiotomy with symphysiotomy, Bunge[3] says that there are quite a number of points in favour of the first operation. The technique and after-treatment are more simple, the healing of the wound more certain, the danger of infection less, and the power of walking is sooner restored. Fehling[1] also holds this view, which appears to be that now generally accepted.

Kroemer,[4] reporting on 153 cases of pubiotomy performed at Bumm's clinic, says that the hæmorrhage could only be called free in 3 per cent of the cases, and was always arrested by firmly plugging the vagina, and the application of a tight binder round the pelvis. In 3 cases the bladder was punctured. In 12 cases, where the delivery was spontaneous, there were only 3 slight lacerations, but in 41 cases terminated artificially, the bladder and urethra were injured 7 times, and in 5 the resulting vesico-vaginal fistula had to be closed by subsequent operation. Of the 49 children born alive, 46 were discharged from the hospital healthy. About one half the women subsequently examined, complained of more or less trouble, but direct connection with the operation could seldom be demonstrated. Nine women who had undergone the operation became again pregnant, but in only one had the operation to be repeated. In only 5 of the cases subsequently examined had bony union occurred. The operation therefore, in most cases definitely enlarges the pelvis. According to Kroemer, suspected infection, eclampsia, prolapse of the cord, and inefficient contractions of the uterus, contraindicate pubiotomy. It is only to be attempted after the cervix is completely dilated, and when the contraction is moderate (C.V. not less than 7·5 cm.). Delivery should be spontaneous if possible.

Scopolamine-Morphine Narcosis.—Halliday Croom[5] details his experience of scopolamine-morphine narcosis in labour. He has thus treated 62 cases. He advises a dose of $\frac{1}{200}$ gr. of scopolamine and $\frac{1}{6}$ gr. of morphia. The painfulness of the contractions is thereby markedly diminished, and in some cases abolished, while the patients slept soundly between the pains, and in most cases for one to two hours after the completion of labour. The children were not adversely affected by the drug. In rather over half the cases, one injection was sufficient. In the remainder, a second but smaller dose was required. He found that if a second injection is necessary it is better to give the scopolamine alone in dosage of $\frac{1}{400}$ to $\frac{1}{100}$ gr., as the case seems to demand. The drug should be given in the *second stage* of labour as a rule. Its results are threefold: (1) It acts as a soporific; (2) It produces narcosis, and in some cases complete anæsthesia; (3) It appears to cause amnesia, abolishing remembrance of the suffering during labour. In one or two cases it was given during the first stage, and seemed to hasten the dilatation of the cervix. Forceps were twice used under its influence, apparently painlessly, but usually chloroform was also administered if artificial aid was required. He has noted no ill effects as regards the mother, but the child is often born sleepy or almost comatose, breathing slowly and not crying, like a person under the influence of a narcotic. The children thus born were, however, all able to be revived by the usual methods, and no life was lost. Possibly there is a slight tendency to post-partum hæmorrhage after its use. The author thinks it most suited for primiparæ of highly nervous temperament, as it can be administered without bad effects much earlier than is the case with chloroform. It is no contraindication to the subsequent administration of the latter drug; but, on the contrary, forms an excellent prelude to it. The drug does not keep well in solution, so he employed the tabloids made by Burroughs & Wellcome. He concludes by saying that, in scopolamine-morphine narcosis, we have an efficient and safe means of controlling the pain of labour.

E. Boesch[6] reports that scopolamine-morphine narcosis has been used more than 2000 times at the Women's Hospital at Bâle, with the most satisfactory results.

Rupture of the Uterus.—Eden[7] published an important paper on the treatment of rupture of the uterus during childbirth. He pointed out that the current teaching in this country was that laid down by Spencer at the Obstetrical Society of London in January, 1900, namely, that the best results after this disaster were to be obtained by avoiding abdominal section, and packing the uterus and the rent with iodoform gauze, after evacuating with the hand all effused blood. Varnier, of Paris, in 1901, read a paper at the French Congress of Obstetrics and Gynæcology, showing that out of 11 cases treated by packing 10 died, whilst of 12 cases subsequently treated by abdominal section 3 recovered. Eden recorded three cases of his own in which abdominal section was resorted to, in one case after plugging had failed, and in

two cases in preference to that treatment. Two of the cases recovered. The risks of the accident are shock, hæmorrhage, and sepsis. As regards shock, he considers it the least serious of the three, and states that the fatal result is not due to this cause. Dangerous hæmorrhage occurs in over 40 per cent of the cases. Serious external bleeding is rare in complete rupture, but frequent in incomplete rupture. He points out that the blood comes usually from the edges of the tear, and is not as a rule due to atony of the uterus, which in most cases is well retracted. Further, the uterine or ovarian arteries may themselves be torn. The danger of sepsis is chiefly due to the fact that most of these patients have already passed through a severe labour, and have undergone much manipulation. Probably 50 per cent of the total mortality is due to this cause.

Discussing the treatment, Eden states: (1) Incomplete ruptures of moderate severity, involving only the lower half of the broad ligament, may be treated expectantly by drainage or packing. (2) Abdominal section, for exploration of injury and arrest of the hæmorrhage, will be required in all other cases. (3) According to circumstances, this may be followed by (*a*) packing and drainage; (*b*) hysterectomy. (4) In most cases of extensive rupture removal of the uterus will be required. (6) In the present state of our knowledge, suture of the rent is not to be recommended except where its position is easily accessible, its extent small, and the uterus may be reasonably deemed not to be gravely infected.

In the discussion that followed, Spencer adhered to his original views, but the majority of the speakers agreed that no universal rule could be laid down, each case requiring treatment founded on its peculiarities. Grimsdale,[8] in a paper on the same subject, expresses similar opinions to those enunciated by Eden.

[A study of a number of cases recently published as a result of the increased interest in the determination of the proper treatment of this disaster, appears to me to show that bold and prompt surgery is the most likely course to succeed.—V. B.]

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 9, 1909; [2]*Med. Press*, Apr. 21, 1909; [3]*Ibid.* July 21, 1909; [4]*Berl. klin. Woch.* 1908, No. 22, in *Brit. Jour. Obst. and Gyn.* Nov. 1908, p. 365; [5]*Brit. Jour. Obst. and Gyn.* July, 1909; [6]*Centr. f. Gyn.* 1908, No. 49, in *Brit. Jour. Obst. and Gyn.* Feb. 1909; [7]*Brit. Jour. Obst. and Gyn.* June, 1909; [8]*Liver. Med.-Chir. Jour.* Jan. 1909.

LABYRINTHINE NYSTAGMUS. (*See* NYSTAGMUS.)

LAPAROTOMY. *John B. Deaver, M.D., LL.D.* / *Astley P. C. Ashhurst, M.D.* } *Philadelphia.*

In 1000 laparotomies, Munro[1] observed 34 patients who showed signs and symptoms pointing to trouble in the respiratory organs; but of these only 11 were directly attributable to the operation. In the other cases there were pre-existing lesions of the lungs or heart, which were not made materially worse by the operation, or there were merely cough or asthmatic signs of no particular significance. Four of these 11 patients died, giving a mortality from post-operative

pulmonary complications of 0·4 per cent. Comparing this with a death-rate of 3 to 5 per cent from such cases, reported by most of the active foreign clinics, Munro seeks the explanation of his own excellent results in careful routine methods of preparation, etherization, and after-care. He avoids slopping water or antiseptic solutions (even if hot) over the patient when preparing the abdomen for operation; takes care that the patient does not lie in a puddle of water during the operation; uses ethyl chloride inhalations followed by ether, administered "in as small a quantity as possible by the drop method on open gauze;" gives morphine and atropine just before starting the anæsthesia; and after the operation carefully keeps the patients protected from exposure, but does not overburden them with so many blankets as to produce sweating. "In practically all cases, except inguinal and femoral hernias, the patient is set upright in bed at once after operation or within a few hours, and the majority are out of bed in forty-eight hours, and are given as liberal a diet as they can be persuaded to take. All are encouraged to move the body and extremities, and they are given water liberally to keep down thirst and to prevent the dirty dry mouth that comes with lack of moisture."

L. A. Bidwell[2] agrees with Box's view that most of the cases of pulmonary embolism and thrombosis are caused by the detachment of a clot which has formed in the right side of the heart, and not to the lodgement of an embolus from a distance. Prevention certainly is more apt to be successful than attempts at cure. Eight cases of so-called pulmonary embolism have occurred in Bidwell's practice, six of them after laparotomies; and in four cases autopsy showed the embolus lodged in the right pulmonary artery. Methods of prevention enumerated by him comprise "the treatment of anæmia before operation; giving excess of fluids, the use of citrates, and getting the patient up as soon as possible after an operation. Lime salts, magnesium carbonate, and milk should be avoided."

Fig. 62.—W. Hill's direct vision operating Laryngoscope.

REFS.—[1]*Jour. Am. Med. Assoc.* Aug. 7, 1909; [2]*Pract.* Feb. 1909.

LARYNGOSCOPY.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

W. Hill[1] demonstrated at the British Medical Association Meeting in Belfast a new and direct vision operating laryngoscope (*Fig.* 62), the special feature of which is the size of its lumen, which permits

of large-sized forceps and other instruments being employed within the larynx without obscuring the field of vision. The instrument possesses also a detachable handle, so that the spatula can be inserted into Brüning's hand lamp if proximal illumination be preferred.

The large lateral slit is made to facilitate the introduction of a tube containing radium into the upper third of a cancerous gullet, a method of treatment which Hill, following Guisez, has employed with advantage in ten cases of gullet carcinoma.[2]

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 16, 1909; [2]*Proc. Roy. Soc. Med.* (*Laryng. Sect.*).

LARYNGOSTOMY.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

The operation known as laryngostomy has for some time past been discussed in papers devoted to the study of diseases of the throat, and considerable interest has been aroused as to the method and the results obtained. Mr. C. Nourse[1] gives an excellent translation of an article from the pens of Drs. Sargnon and Barlatier, and it is to this translation that the writer is indebted for the following remarks.

The object to be attained by the operation of laryngostomy is, by laying open the larynx and the upper part of the trachea, to insure a permanent opening, or a temporary one of long duration. The operation comprises four stages: (1) Laryngostomy; (2) The dilatation and dressings; (3) The autoplasty; (4) The observation and maintenance of an aperture in the trachea for safety. The operation may be performed under general anæsthesia or by local anæsthesia with Schleich's solution.

The actual operation of laryngostomy comprises: (*a*) The section of the soft parts and larynx; (*b*) The median division of the scar tissue; (*c*) The suture of the larynx to the skin; (*d*) The adjustment of the drain and the dressing. After all hæmorrhage has ceased, the larynx or trachea and larynx are opened from below upwards, the incision extending as far upwards as the upper border of the thyroid cartilage. In cases where the larynx is closed by cicatricial tissue this median division may be difficult. The opened-up larynx should then be packed with gauze soaked in cocaine-adrenalin solution. In dividing the scar tissue, it is necessary to proceed with caution, so as not to injure the œsophagus. The scar tissue should not be excised, as it gradually melts away from continuous contact with the rubber tube. The mucous membrane of the laryngo-tracheal cavity is then united to the cut edges of the skin by means of strong silk sutures. The cannula is now placed *in situ*. To dilate, red rubber tubing is used. In children 6 or 7 cms. is the usual length required, beginning with a tube of No. 15 or 16 calibre. The tube is cut straight at both ends or slanted at one of them, the sharp edges being carefully rounded by passing each end of the tube through a flame and then wiping the melted part with a tampon moistened with alcohol, chloroform, or ether. A piece of silk is passed through the anterior surface of the rubber drain, and for the first month the drain is packed

with gauze to prevent solids and liquids passing into the trachea. In order to limit any upward excursion of the drain, the threads by which it is moored are attached to the lateral rings of the outer cannula, Dressings are then applied, and are changed very frequently at first, on account of the oozing from the operation cavity. Gradual dilatation is to be aimed at, larger and larger tubes being used. For the first month the tube should be changed every day, and after that every two, three, or five days according to the state of the wound.

Sloughing generally starts on the second day after the operation, appearing first in the upper part of the larynx and then at the level of the cords. The stage of granulation lasts for at least a month, and great care must be taken to keep down any exuberant tufts. Epidermization takes place by the advance of the epidermis towards the granulations as they are cauterized. As dilatation progresses the skin is drawn more and more inwards by the tube, and the cartilage is also gradually regenerated. The wound is now allowed to close from above downwards upon the rubber dilator. Finally, a plastic operation has to be performed to close the external wound.

REFERENCE.—[1]*Jour. Laryngol.* July, Aug. Sept. 1909.

LARYNX, TUBERCULOSIS OF. (*See* TUBERCULOSIS, LARYNGEAL.)

LEISHMANIASIS. *J. W. W. Stephens, M.D.*

C. Donovan, being dissatisfied with the evidence connecting the bed-bug (*Cimex rotundatus*) with the transmission of this disease, suggests than an insect (*Conorhinus rubro-fasciatus*), known in Madras as the "mother of bugs," may be the agent. This bug is supposed to suck the blood of human beings, and also to feed on the common bed-bug. This bug is widely spread both in and out of India. It is nocturnal in its habits; the male especially is attracted by lamp-light.

TREATMENT.—Quinine, arsenic, fuchsin, and thymol have all been tried, but with no permanent result. One patient was cured after a severe attack of cancrum oris, another after facial erysipelas. Change of air, especially to a hot, dry climate, appears to effect a cure in some cases.

A. M'Kaig[2] records a case treated by **Atoxyl.** On discharge he appeared perfectly well, and the spleen was much smaller.

C. P. Lukis[3] records a few cases cured or improved by atoxyl.

REFERENCES.—[1]*Ind. Med. Gaz.* Mar. 1909; [2]*Edin. Med. Jour.* Dec. 1908; [3]*Ind. Med. Gaz.* June, 1909.

LEPROSY. *J. W. W. Stephens, M.D.*

H. T. Hollmann[1] believes that in **Eucalyptus** we possess a drug which effects marked ameliorations in leprosy. The treatment consists of two parts:—(1) The compound eucalyptus treatment for medicated baths. Formula: Take of thoroughly cut eucalyptus leaves ¼ lb.; of ohia leaves (mountain apple, *Jambos malaccensis*) ¼ lb.; ground hæmatoxylon bark, and ground hemlock bark, each 1 oz. These are

tied in a small muslin bag. Directions.—To make the bath, place bag in 5 gallons of water, boil for 1 hour, of this take 2½ gallons and add to the daily bath. (2) Eucalyptus distillate treatment, for internal use. Formula: Take eucalyptus leaves, cut up thoroughly and place in still, cover with water and place on fire. From a 5-gallon still there result 3 gallons of distilled eucalytpus. Directions.—Take ½ teaspoonful in a glass of water three times a day. Gradually increase the dose until the patient is taking a tablespoonsful three times a day. During two years the author treated 275 patients. Those who showed the most marked improvement, used after the bath an inunction composed of:—

℞ Oil of Eucalyptus | Oil of Chaulmoogra, equal parts.

All these patients had leprosy from five to twenty years. The author believes that the treatment would *cure* if the case was in the incipient stage.

V. G. Heiser[2] describes a case of apparent cure of leprosy by means of **X Rays.** The patient presented the following lesions when treatment was begun. A tubercle above the left eyebrow; alæ nasi infiltrated; a macula on the lower lip; right ear hypertrophied, reddish brown; chest, some anæsthetic spots. The first sign was noticed on the right ear two years before treatment was begun, on Nov. 5th, 1906. The lesions on the head were exposed to X rays every third day for ten minutes at a distance of 25 cms. from the tube. From Nov. 21st to Jan. 21st, 1907, the tube was placed at a distance of 18 cms. from the head. The lesions especially in the right ear were now rapidly growing smaller. The distance of the tube was varied from time to time, and in June, 1907, the parts were almost normal. During January, 1908, the case was cured from the clinical standpoint. No bacilli could be found in the lesions, but they could in scrapings from the nasal septum. From June 15th to Aug. 1st, 1908, bacilli could not be found anywhere, and he was apparently cured.

D. A. Turkhud[3] records his two years' experience of the use of **X Rays.** After a year's treatment the effect on *unexposed ears* was in the majority of cases to produce atrophy—the preliminary stage of cure. In the previous year the whole of the face had been treated, but the improvement was not maintained in the second year.

B. Williams[4] believes that in **Nastin** we have a specific treatment; that the results in early cases will approximate to a cure.

J. J. Almkvist and F. Sandman[5] have applied **Wasserman's Syphilis Reaction** in twenty-six cases of leprosy, four of which gave a positive result and four a partial result. In these cases syphilis could certainly be excluded.

C. Bruck and E. Gessner[6] have also applied the test to 10 cases. Of 7 cases of lepra tuberosa, 5 gave a positive result, 2 were negative, and 3 anæsthetic cases were negative. Whether the substance which in two such very dissimilar diseases as syphilis and leprosy gives identical result is the same in each case remains to be decided. In Europe this

fact will hardly interfere with the diagnosis of syphilis, but it must be taken into account in regions where leprosy is prevalent.

REFERENCES.—[1]*N.Y. Med. Jour.* Mar. 27, 1909; [2]*Med. Rec.* Oct. 31, 1908; [3]*Ind. Med. Gaz.* Mar. 1909; [4]*Ibid.*; [5]*Centr. f. inn. Med.* Nov. 22, 1908; [6]*Berl. klin. Woch.* Mar. 29, 1909.

E. Graham Little, M.D., F.R.C.P.

The second International Congress on Leprosy[1] was the occasion of some interesting and important communications on etiology, means of diagnosis, and methods of transmission of this disease. The findings of a mixed French and Danish Commission which studied the disease in the Antilles was against the part supposed to be played by bites of insects. The bacillus of leprosy does not ordinarily circulate in the blood, being found there only at times of aggravation of the disease, and insects could hardly absorb bacilli by mere suction of the blood. It is possible that shortly before death the tissues become charged with bacilli, and that at these times insect bites may be an important source of contagion. A method of diagnosis has been suggested by which bacilli may be readily demonstrated. If the nodule of leprosy be transfixed by the fine point of a pipette, and aspiration performed, the serous fluid thus withdrawn is usually full of bacilli. It would appear also that the Wassermann reaction, performed on the same lines as in syphilis, is equally successful in leprosy. The bacillus can apparently be conveyed in the mother's milk to her suckling, and the fæces and the urine of infected persons are crowded with bacilli.

The **Leproline** of Rost affords a means of diagnosis by the reaction which occurs with leprous persons on its injection, in a manner analogous to that of tuberculin. Leproline was reported by some members of the Congress to have been useful in treating cases of leprosy. Results with **Nastin** and its modification **Nastin** β were also reported by several members of the Congress to be favourable. **Antileprol**, a form of chaulmoogra oil prepared by Bayer, appears to be better tolerated than the oil itself, and to have been followed by good results.

The following resolutions were voted by the Congress: (1) Leprosy is a contagious disease; whatever may be the method of contagion, no country is exempt from possible infection by leprosy. (2) Isolation of lepers in leprous countries is recommended. (3) Lepers should be excluded from occupations which allow of transmission of the disease. (4) Children of leprous parents should be separated from their parents and kept under observation. (5) Persons who have shared dwellings with leprous persons should be examined from time to time by skilled physicians. (6) The clinical study of the disease leads to the conclusion that leprosy is not incurable, but no certain remedy has yet been discovered.

White and Richardson[2] report a singular case of leprosy which was at first diagnosed as syphilis by a large number of European and American dermatologists, and the error was corrected only by finding leprosy bacilli in the sections of the lesions. The patient was a native of lowland Russia, and had been in intimate association with a fellow-

countrywoman who had previously been diagnosed as a leper. The earliest symptoms noted were like those of erythema multiforme, and an "autointoxication" was the explanation offered. There was some erythema and œdema of the face, and later several large pea-sized punched out ulcers and older pigmented scars. There was no anæsthesia. The hair of the eyebrows was scanty, the nose a little thickened; there was conjunctivitis and old iritis, general adenitis; cyanosis of the hands. The ulcers healed rapidly after 10 injections of mercury, and the patient put on weight. In the face of such puzzling facts it is not surprising that the diagnosis of syphilis was retained until the finding of leprosy bacilli cleared up the question completely.

REFERENCE.—[1]Summary of Comptes Rendus, Darier and Dubreuilh, *Ann. de Derm. et de Syph.* Oct. 1909, *p* 579; [2]*Jour. Amer. Med. Assoc.* Jan. 2, 1909.

LEUKÆMIA. *George Lovell Gulland, M.D.*

Larrabee[1] has used the **Mixed Toxins** of streptococcus and *B. prodigiosus* in four cases of leukæmia. Of these, three of myeloid type showed improvement, varying between symptomatic recovery and temporary betterment. An acute lymphatic case was not affected. He considers that the treatment does not give hope of permanent cure, and that it does not compare favourably with treatment by X rays. It is more painful and dangerous [with this I agree.—G. L. G.], but may be tried when radiotherapy is not available.

L. A. Levison and H. W. Dachtler[1] report a case of chronic type treated by **X Rays** by the **Pancoast Method.** This consists in mapping out the bone-marrow of the body into about eight districts, or regions, and exposing these consecutively and in rotation. By this means the marrow, which is the primary seat of the disease, is directly attacked, and toxic changes are less likely to occur. In the older method, in which spleen and lymph-glands were X-rayed, leucocytes were destroyed in them, and the leucocytic substances formed attacked the marrow indirectly. In the case reported, the spleen and glands suffered first, with some improvement in the blood, but none in the general condition. A short course of high frequency was then given, in the endeavour to improve the patient's general state. Thereafter the Pancoast method was commenced, with immediate and very definite improvement both in the blood and the patient's general condition. The splenic enlargement disappeared, and he was symptomatically cured; but the leucocytes in the last count were still 40,000, of which 84 per cent were lymphocytes. [This is probably the best result that could have been obtained by any method of treatment. Lymphocythæmias of acute type are almost always injuriously affected by X-ray treatment, and those of chronic type also, occasionally. When they do react favourably, they very seldom do as well as the chronic myeloid cases.—G. L. G.]

REFERENCES.—[1]*Bost. Med. and Surg. Jour.* 1908; [2]*Jour. Amer. Med. Assoc.* Mar. 1909.

LICHEN. *Graham Little, M.D., F.R.C.P.*

A chronic, itching, papular eruption of axillæ and pubes, commonly classed either as lichen simplex chronicus of Vidal, or "papular eczema," has more recently been included in a general group of "neurodermatites" by Brocq and other French writers. Fordyce[1] has made several histological examinations of the condition as it appeared in a case under his observation, and found the sweat coils dilated and acanthosis localized about the duct. Antipruritics and X rays were singularly inefficacious, and the patient improved most under a course of sea-baths. He considers the causation to be toxic.

Reference.—[1]*Jour. Cutan. Dis.* May, 1909.

LIVER ABSCESS. *J. W. W. Stephens, M.D.*

R. Havelock Charles[1] discusses in a lengthy paper, which should be consulted in the original, the subject of tropical abscess of the liver in all its bearings. He first points out how marked is the difference between the susceptibility of the Indian and the European to abscess of the liver. Thus in the native Indian army in five years there were 23,516 cases of dysentery and 72 cases of liver abscess, while in the British army there were 5,581 cases of dysentery and 860 cases of liver abscess. "Dysentery," the author says, "may be an antecedent of liver abscess; abscess of the liver is not amongst Indians a common sequel to it." The author considers that the liver of the European, unlike that of the Indian, becomes more vulnerable under conditions of tropical life, that in fact a condition of hepatic congestion and irritation is induced. The conditions which produce this condition in the European are heat, food, alcohol, malaria, and abuse of exercise.

The Relationship of Dysentery to Liver Abscess.—Statistics are next brought forward to show that in fatal cases of liver abscess the gut may be normal; thus in one series out of 82 fatal cases of liver abscess the gut was normal in at least 23, possibly 63, if those are included where no statement is found in the record. It is concluded that liver abscess may arise quite independently of dysentery.

The Relationship of Amœbæ to Liver Abscess.—The author supports his view as to the want of connection between amœbæ and abscess by quoting amongst other data the figures given in the article Amœbic Dysentery.

Differential Diagnosis.—The most important conditions to differentiate are: (1) *Malaria:* chronic malaria with hepatitis may closely simulate liver abscess, but the spleen is enlarged. (2) *Febrile congestion of the liver*, due to malaria, alcohol, dietetic errors. (3) "*Hepatitis*," with diarrhœa, fever, pain, appears and disappears. (4) *Chronic intermittent fever*, with indigestion. (5) *Intermittent hepatic fever due to infective cholangitis.* There is a history of cholelithiasis, grave symptoms, tender enlargement downwards, acute course with intervals of fair health. If there is suppuration the temperature is continuously raised. (6) *Syphilis*, gummata of the liver.

As regards the signs of liver abscess, we may consider the following:

(1) *Fever.* It is one of the most constant signs, but the character of it is variable. (2) *Sweating.* It is generally profuse, especially at night. (3) *Irregularity of bowel* may be complained of, or there may be a history of dysentery or diarrhœa. (4) *Indigestion,* anorexia, dyspepsia, alternating constipation and diarrhœa, are common. (5) *Sudden pain* over the liver. (6) *Breathing* is defective on the right side, the movement at the base of the chest is markedly less. (7) *Temperature.* A normal or subnormal temperature is possible, or either of these conditions with an evening rise. Hectic cases present no difficulty. (8) *Blood count.* Hyperleucocytosis, with an increase of polynuclears, provided the clinical signs coincide, is diagnostic. (NOTE.—Rogers states that the proportion of polynuclears is but little if at all increased in amœbic abscess in its presuppurative stage). (9) *Palpation.* A zone of maximum sensibility may be located. (10) *Percussion.* There may be dullness to the fourth or third rib in front; behind possibly to the angle of the scapula. (11) *Position of abscess.* In the right lobe in 85 per cent of cases, at the posterior and upper aspect. When the abscess is on the under side of the right lobe the colon may be displaced forward, giving resonance to percussion.

TREATMENT.—In patients threatened with abscess: (1) Absolute **Rest** in bed. (2) **Anodyne Liniments,** with hot fomentations from the spine to the linea alba. (3) **Sodium Salicylate, Ammonium Chloride, Sodium Sulphate, Potassium Iodide, Ipecacuanha,** according to the case. (4) The alimentary canal should be made as clean as possible.

Aspiration.—Strict asepsis should be carried out. Puncture in the lowest space, anterior maxillary line; seventh space, mid-axillary line; over the centre of dullness behind, unless there are signs pointing definitely elsewhere. Put a pad over the punctures and bandage firmly, so as to press the liver upwards. There is practically no danger.

Operation.—Either (1) by the transpleural route over the eighth or ninth rib, (2) by the subcostal route, or (3) at the side.

L. Rogers[2] believes that amœbic abscess of the liver is an easily preventable disease. (He finds that dysentery is present in 90 per cent of cases in which there was both clinical and post-mortem evidence.) He considers that amœbic abscess may be easily recognized in its presuppurative stage by the presence of marked leucocytosis, with little or no increase in the proportion of the polynuclears. It can be rapidly cured by full doses of **Ipecacuanha.** His later experience fully confirms his first expressed opinion.

Post-operative Sepsis in Amœbic Abscess.—80 per cent of liver abscesses when opened are sterile, whereas afterwards 75 per cent contain micrococci either in the pus of dressings or post mortem. The author considers that this sepsis is a not unimportant factor in the mortality of about 60 per cent. He advocates a new treatment, viz., the using of a special flexible sheathed trocar by means of which drainage and repeated **Irrigation with Quinine** can be carried out without introducing air (and micrococci).

A. Hooton[3] records a successful case of abscess of the liver treated

by aspiration and injection of sterile quinine solution (30 gr. of bihydrochlorate of quinine to 4 oz. of water), but considers that all large abscesses, at all events of long duration, should be opened and drained at once.

E. Marchoux[4] only twice out of 27 cases found amœbic abscesses sterile, although he holds that they become so later, like all old abscesses. He further regards the proportion of polynuclears in the blood, rising at times to 90 per cent, as an indirect proof of bacterial infection.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 24, 1908; [2]*Ibid.*; [3]*Ibid.*; [4]*Ibid.*

LIVER, CIRRHOSIS OF. *Rutherford Morison, F.R.C.S.*

W. B. Warrington[1] discusses the differentiation in clinical diagnosis between uncomplicated cirrhosis of the liver and chronic simple peritonitis with perihepatitis. The diseases that come up for consideration in this class of case are cancer, cirrhosis, perihepatitis, and syphilis. He emphasizes the importance of always considering syphilis, and believes that **Potassium Iodide** should be constantly used for the purpose of excluding any possible syphilitic disease of the liver. He quotes his case of a lady, aged 56, with a typical gummatous liver and spleen, who had brought several healthy children into the world. He presents a microscopical section from the liver of a male, aged 19, which is akin to congenital syphilis. There was a history of abdominal pain and hæmatemesis, and the patient died in a comatose state with a low muttering delirium. The patient was too young for acquired syphilis, and congenital syphilis of the liver terminates at an earlier period, in recovery or death. In general, in addition to a history of alcoholic excess and dyspepsia on the one hand, or syphilis on the other, suggestive points in favour of the diagnosis of specific trouble are: the fairly healthy appearance of the patients, the absence of wasting and toxæmia, of hæmorrhage or jaundice, or a large spleen. Although alcohol is a certain etiological factor in cirrhosis, yet the typical disease, both pathologically and clinically, may have an origin distinct from this cause or syphilis, for sometimes no definite cause can be assigned.

It is impossible to say when cirrhosis will begin to produce symptoms: the end is rapid when once they have appeared, for patients only survive the ascites a short time, and many die of toxæmia with delirium and coma. If omentopaxy is performed for the prevention of hæmorrhages, there are two indications: (1) That the disease is in an early stage; (2) That there must already be evidence, from the appearance of the veins over the skin of the abdomen, that this spontaneous formation of a collateral circulation is taking place.

Apart from uncomplicated cirrhosis, there are some pathological conditions characterized by ascites, for the permanent removal of which **Omentopaxy,** etc., have been recommended. These are: (1) Chronic perihepatitis and peritonitis, including the sugar-ice liver, but without cirrhosis of the liver; (2) Chronic peritonitis combined with cirrhosis; this is nearly always a partial perihepatitis and peritonitis; (3) The cardiac cirrhosis, including the pseudo-pericarditic

cirrhosis, and the liver of mediastino-pericarditis. On general pathological grounds the indications for the operation in uncomplicated cirrhosis are very limited. In the ascites stage they should be useless; and if, in the pre-ascitic stage, syphilis can be excluded, and the alcoholic or other injurious habits be arrested, he questions if the ascites would ever appear.

Reference.—[1]*Liver. Med.-Chir. Jour.* July, 1909.

LIVER, HÆMORRHAGE OF. *Rutherford Morison, F.R.C.S.*

J. Hogarth Pringle[1] says that statistics show wounds of the liver from contusing violence to be much more fatal than localized cutting injuries. By observations carried out in the post-mortem room, he had found that a completely satisfactory and tolerably easy method of arresting hæmorrhage was probably to be obtained by passing ligatures through the liver substance at a sufficient distance from the margins of the wound to make certain they would not slip, and, by pulling these up as tight as possible, allowing them to cut completely into the liver tissue; the coats of the vessels in the liver are sufficiently resistant to permit this to be done without giving way themselves. By experiment on animals, he found that it was possible to remove portions of the liver bloodlessly by clamping the portal vessels and using this ligature. Although clamping the portal vessels in animals had previously been found to be very fatal, his experiments proved that one hour at least of total occlusion did no harm.

In two patients operated upon by him, this method, grasping the portal vessels between a finger and thumb, acted admirably. There was perfect control of the bleeding and a clear field for operating. He suggests two methods of exposing the liver in case of difficulty: (1) By dividing the coronary and right lateral ligaments and dislocating the liver up to the abdominal wound; and (2) By dividing some ribs in the lower thoracic wall and holding up the flap of ribs and diaphragm. As soon as the abdomen is opened, the relief of tension allows of free bleeding, and it is only possible to save some of these cases by seizing the portal vessels at once. The permanent arrest of hæmorrhage is best effected by ligature of the liver tissue in mass when that is possible; where it is impracticable, reliance has to be placed upon packing the wound.

Reference.—[1]*Ann. Surg.* Oct. 1908.

LUMBAR PUNCTURE. *Purves Stewart, M.D., F.R.C.P.*

The procedure of lumbar puncture is now firmly established as a diagnostic and therapeutic measure of the utmost value. Its technique need not here be recapitulated. Suffice to say that the spinal theca may be tapped with safety and ease in any interlaminal space between the second lumbar and the first sacral vertebræ. Practically speaking, there is but one risk associated with lumbar puncture, and that is a preventable one—sepsis. In a small proportion of cases violent headache follows the withdrawal of the cerebrospinal fluid for diagnostic

purposes; but this can usually be prevented by making the patient rest for a day after the puncture.

As the fluid is escaping from the needle it is of importance to notice its pressure. Normally, it wells out slowly, drop by drop, but in certain conditions associated with increased intracranial pressure (e.g., meningitis of any variety, uræmia, cerebral tumours, etc.), it may gush out much faster, even in a jet. This pressure can be measured with accuracy by means of a small mercurial manometer; and Ebright[1] has described a convenient T-shaped valve, by means of which the pressure can be read off in the manometer at any stage of the puncture, without detaching the instrument from the needle. Ebright's modification (*Fig.* 63) consists in placing between the needle and the manometer a nickel-plated, T-shaped tube, with a shut-off valve in two of the arms, by means of which fluid may be withdrawn while the manometer is still in place by opening the valve (*Fig.* 64, B) in the free arm of the T. Subsequent pressure-readings may be made by shutting this outflow valve (*Fig.* 64 B), and leaving open the one (*Fig.* 64 A) toward the manometer. All the rubber-tubing and the T-shaped piece should be boiled, as well as the needle. One is then able to collect the desired fluid for bacteriological examination from the outflow arm (*Fig.* 64 C)

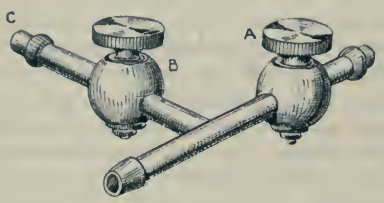


Fig. 63.—Ebright's stopcock, obviating the removal of the manometer when performing spinal puncture. A, stopcock to shut off manometer; B, outflow stopcock; C, outflow.

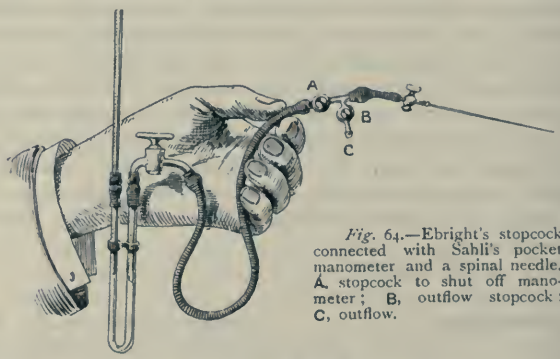


Fig. 64.—Ebright's stopcock connected with Sahli's pocket manometer and a spinal needle. A, stopcock to shut off manometer; B, outflow stopcock; C, outflow.

without difficulty, to regulate the speed of outflow, and to be guided by various manometric observations of the pressure as to the quantity to be drawn off.

The normal pressure of the cerebrospinal fluid varies from 10 to 35 mm. of Hg, being lower in the recumbent posture than when the patient is sitting up. In meningitis the pressure is enormously increased, 100 mm. of Hg being a common reading; and Foster[2] has

even recorded a case of epidemic cerebrospinal meningitis with a pressure of 250 to 300 mm.

The naked-eye appearances of the cerebrospinal fluid should not be neglected. Instead of being clear and watery the fluid may be turbid and opalescent, or even purulent, as in certain cases of meningitis. Tuberculous meningitis, however, often yields a clear fluid which, on standing for six to twelve hours, yields a characteristic fine filmy coagulum. Blood-stained fluid may be due to local bleeding, from wounding of arachnoidal vessels by the needle, in which case centrifuging will drive the red corpuscles to the foot of the tube, leaving the supernatant fluid clear. Or there may have been a pre-existing cerebral or spinal hæmorrhage, in which case the supernatant fluid remains yellow, even after centrifuging.

The chemical characters of cerebrospinal fluid are also of diagnostic significance. In acute meningitis, for example, there is marked excess of albumin, whilst in general paralysis of the insane there is an excess of proteid in the form of a euglobulin. A convenient method of demonstrating these globulins is by Noguchi's test,[3] which is performed as follows :—To 2 parts of cerebrospinal fluid are added 5 parts of a 10 per cent solution of butyric acid in normal saline solution. The mixture is heated to boiling, and then 1 part of a normal (4 per cent) solution of sodium hydrate is added, and the mixture is again boiled briefly. On standing for two to thirty minutes, if globulin be present, a flocculent or granular precipitate is seen. An even simpler method of demonstrating globulin is by the ammonium sulphate test,[4] in which a saturated solution of ammonium sulphate is placed at the bottom of a test tube, and the cerebrospinal fluid is gently run in to lie above this, when a white ring appears at the junction of the two fluids. In acute meningitis, whether tuberculous or septic, sugar is usually absent. In chronic meningitis, in tabes, and in general paralysis of the insane, it is often diminished.

The bacteriological characters of the cerebrospinal fluid are of value, chiefly in cases of meningitis, to identify the organism causing the disease. Thus, we find the *Diplococcus intracellularis* of epidemic cerebrospinal meningitis, the tubercle bacillus, the pneumococcus, staphylococcus, streptococcus, etc. We should remember that the failure to demonstrate tubercle bacilli does not exclude tuberculous meningitis, although its presence confirms such a diagnosis. Inoculation experiments on guinea-pigs may be of value in doubtful cases.

Practically, however, cytological examination of the fluid is the most valuable method of examination at our disposal. Normal cerebrospinal fluid contains no polymorphonuclear leucocytes, and only a few small mononucleated lymphocytes, with an occasional endothelial plate. But in certain organic diseases of the central nervous system, or its meninges, there may be a large excess of leucocytes—polymorphs or monomorphs. Briefly stated, in cases of acute meningitis we find a leucocytosis, most of the cells being polymorphs. When recovery begins, the polymorphs diminish in number, and become replaced by

monomorphs. These latter in turn disappear as convalescence becomes complete. Tuberculous meningitis is usually associated with a lymphocytosis, but during an acute exacerbation of the malady polynuclear cells may outnumber the mononuclears. In most of the chronic syphilitic diseases of the central nervous system we find a distinct lymphocytosis; and this is still more marked in cases of tabes and of general paralysis, where lymphocytosis of the cerebrospinal fluid is by far the most constant of the physical signs.

Therapeutically, lumbar puncture is of the utmost value in relieving conditions of increased intracranial pressure from whatever cause. Even in **Tuberculous Meningitis,** where the tubercle bacillus has been demonstrated in the fluid, cures have been obtained by repeated lumbar punctures, as in cases recorded by Freyhan[5] and others. I myself have seen more than one comatose patient suffering from tuberculous meningitis restored to consciousness after lumbar punctures; and I can recall at least one case when the patient ultimately made a complete recovery. In cases of **Epidemic Cerebrospinal Meningitis,** the withdrawal of the pus-laden fluid, followed by injection into the sac of antimeningococcus serum, has reduced the mortality of the disease to a most remarkable extent, as demonstrated in recent epidemics in New York, Belfast, Edinburgh and elsewhere. **Uræmic Convulsions** are also greatly benefited by lumbar puncture; and in **Tetanus** we can administer morphine and eucaine, magnesium sulphate, or tetanus serum, conveniently by this route. (*See also* TETANUS.)

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* Nov. 7, 1908; [2]*Amer. Med.* Jan. 1907; [3]*Jour. Exper. Med.* 1909, vol. xl p. 84; [4]*Rev. of Neurology and Psychiatry*, 1909, p. 379.

LUNG, ACUTE ŒDEMA OF. (*See* ŒDEMA.)

LUNG, COLLAPSE OF. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Under the title of "Massive collapse of the lung," W. Pasteur[1] has shown in his Bradshaw Lecture the existence of a form of collapse, the result of paralysis of the muscles of respiration, quite distinct in origin from the patchy collapse so common in bronchopneumonia. In the latter an obstruction of a bronchus is present, which prevents the renewal of the contained air as it is taken up and removed by the circulating blood: in the former no obstruction exists, but the collapse is brought about by the elasticity of the lung itself as soon as the muscular power is lost which normally overcomes this tendency to contraction and keeps the lung in a state of expansion. The resulting collapse may be so extensive as to deflate an entire lobe. In paralysis of the intercostals the upper part of the thorax may be flattened in consequence to such an extent that in one of the quoted cases it looked as though the upper part of the chest had fallen in: movement was completely absent, and there was marked dullness, with tubular breathing and râles. Equally surprising is the rapidity with which improvement may occur and such signs pass away as soon as muscular power is restored. In the case of diaphragmatic paralysis the lower

lobe is affected, and may be rendered totally airless, so as to sink in water almost in its entirety. Such conditions can be distinguished in life from pneumonia only by the absence of high fever. The paralysis necessary for such an effect must be rapid and profound, and most of the examples quoted are taken from cases of diphtheria, acute myelitis in one instance being the cause.

The condition, however, Pasteur seeks to show is not limited to primary nervous disease, and he would extend it to the chest complications which follow operation, especially on the abdomen. The consolidation in these cases chiefly affects the bases of the lungs, and is commonly held to be due to sepsis. On Pasteur's view, loss of functional activity of the lung is a factor, and paves the way for the pneumonia, the pain of the abdominal wound interfering with free breathing and expectoration. By means of a special apparatus, he has been able to examine the movement of the diaphragm by the fluoroscope, and in one case of gastroenterostomy in which there was no marked pain, no sepsis, and no disease of the lung prior to operation, the diaphragm was found to be motionless. He suggests as an explanation a reflex inhibition of respiratory movement. As the writer claims, his interesting lecture and observations have thrown new light on the nature of post-operative lung complications.

REFERENCE.—[1]*Lancet*, Nov. 8, 1908.

LUPUS ERYTHEMATOSUS. *E. Graham Little, M.D., F.R.C.P.*

MacLeod[1] sums up the present current views of the nature of lupus erythematosus as follows: (1) There is not sufficient evidence, clinical, histological or bacteriological, to show that lupus erythematosus is a tuberculous lesion. (2) Lupus erythematosus is probably not a pathological entity due to some specific cause, but a morbid condition of the type of an erythema, persistent in character and tending to be succeeded by atrophy, and it may be brought about by a variety of causes in a predisposed individual; such predisposing causes are: (*a*) hereditary weakness; (*b*) enfeebled state of health, e.g., tuberculosis, rheumatism; (*c*) weak peripheral circulation due to anæmia, morbus cordis, etc.; (*d*) a delicate condition of the blood-vessels in the situation usually affected, owing to anatomical reasons. Local causes may also be present, such as sunlight, traumatism, and lastly toxins circulating in the skin and due to visceral disease or defective function, e.g., in cirrhosis, nephritis, etc.

TREATMENT.—This should be directed to removing the local and predisposing causes, where these are evident and their removal is practicable; general and local therapeutics in combination afford the best procedure. **Salicin** and **Quinine** are the two drugs on which most reliance is to be placed, to which **Ichthyol** in 5-gr. doses three times a day, may be added. Local measures are directed to removing the scales, and the reduction of hyperæmia; for the former purpose **Hebra's Soap Liniment** may be used, or soft soap itself; for the latter, various astringent ointments and pastes are recommended, such as

Ichthyol, Adrenalin, Formalin. Caustic action should be resorted to only in the case of smaller circumscribed areas; **Pyrogallic Acid Paste** (6 per cent) applied daily, or **Resorcin Lotion** (10 per cent in spirit) painted on once a week.

Since the publication of this paper many other local methods have been recommended as, on the whole, superior; of these, treatment by ionization, by liquid air, and by carbonic oxide snow may be said to be the most favoured. I have recorded in detail the method of **Ionization.**[2] This is so widely and conveniently applicable by the general practitioner that it forms the most practical and, in my opinion, still the best method of dealing with localized chronic patches of disease. The late Dr. Radcliffe Crocker[3] gave a demonstration at the Dermatological Section of the Royal Society of Medicine of his results with **Liquid Air.** The scarring seemed, to some of those present, to compare unfavourably with the results of ionization. Several cases of excellent results after using **Carbonic Dioxide Snow** were reported by MacLeod.[4]

REFERENCES.—[1]*Lancet*, Oct. 31, 1908; [2]Paper read before the Harveian Society; [3]*Brit. Jour. Derm.*; [4]*Ibid.*

LUPUS VULGARIS. *E. Graham Little, M.D., F.R.C.P.*

Godwin Tomkinson[1] treated successfully a case of lupus vulgaris by direct exposure for four or five hours daily to **Sunlight** at Helouan during the months June to April inclusive. Blistering of the skin exposed occurred from time to time, but was not a serious drawback; the patient's general health materially improved synchronously with the treatment. On the patient's return, apple-jelly nodules had disappeared and the cicatrices were excellent. The head and eye are to be protected during the sun-bath. (For plastic operation after lupus, *see* FACE.)

REFERENCE.—[1]*Brit. Med. Jour.* Oct. 24, 1908.

LYMPHATIC OBSTRUCTION.

(*Vol.* 1909, p. 413)—Sampson Handley has devised an operation which he calls **Lymphangioplasty,** for the relief of solid œdema due to lymphatic obstruction. The principle is to provide the affected limb with a new series of lymphatic vessels by means of silk threads passing subcutaneously from the œdematous area into normal tissue.

LYMPHOCYTHÆMIA, ACUTE, IN CHILDREN.

George Lovell Gulland, M.D.

T. R. C. Whipham[1] reports three cases in children of 2, 5, and 7 years, which presented the usual symptoms of the disease. Glands were enlarged, liver and spleen not so greatly altered; anæmia and hæmorrhages were prominent features. The point in the cases on which, from the diagnostic point of view, Whipham very rightly lays stress, is that in none of them was there a marked increase in the total number of leucocytes. In the first case they varied between 25,000 and 5600, in the second between 17,000 and 20,000, and in the third there were about 6000. In all, however, the percentage of lymphocytes was 90 or more.

All the cases terminated fatally, in three months, four weeks, and nine weeks respectively, from the onset of symptoms. [The author imagines that this type is peculiar to children, which is very far from being the case. The most acute case in my experience was in a young man of 23, who died within a week of the onset of symptoms, and whose leucocytes were 10,000 on the third day of his illness and did not rise above 20,000. The important point in the diagnosis of acute lymphatic leukæmia is not the total number of leucocytes, but the high percentage of lymphocytes. In another case, the initial count was 10,000; this dropped to about 4000, and remained near that figure for the remaining four weeks of life. Throughout, however, the lymphocytes were well over 90 per cent.—G. L. G.]

REFERENCE.—[1]*Clin. Jour.* Dec. 16, 1908.

MALARIA (*See also* BLACKWATER FEVER.) *J. W. W. Stephens, M.D.*

J. A. Le Prince[1] gives a detailed account of the anti-malarial measures adopted in the Canal Zone, Isthmus of Panama. The special difficulties that are encountered in the tropics depend on: (1) The fact that anophelines ovi-deposit during each month of the year. In the wet season the breeding-places seldom dry. Flat and low lands are thus troublesome for about eight months of the year (in Panama). (2) In the dry season, lasting four months, the large streams and small rivers become alive with larvæ, so that there is a large supply of female anophelines at the beginning of the wet season. In the dry season, owing to water collecting at the bottom of the canal, there is a continuous area of breeding-grounds for ten to fourteen miles. This means that there is continuous anopheline propagation in the dry season throughout the canal zone in an area where 70 per cent of the employees live, and in fact the malarial sick-rate is greater in the dry season than in the wet. (3) Open ditches would not be feasible as a drainage method in the Canal Zone, as algæ would choke them in about a fortnight, and where algæ exist larvæ also can exist, as fish are for some reason or another not able to get at them. Removal of the algæ is impossible, as a new growth is formed in a week. (4) Owing to the excessive rainfall—180 inches per annum on the Atlantic, 80 inches on the Pacific slope—numerous depressions become water-containers, and so breed mosquitoes, and these are often hidden by long grass.

Methods of mosquito Destruction.—These comprised: (1) *Fumigation.* (2) *Use of crude petroleum;* by itself it is not satisfactory, but when mixed with a little crude carbolic acid much better results are obtained. (3) *Phinotas oil* is a most effective larvacide, especially in still water, but larvæ occur also in streams with considerable velocity. Fish are not effective larvæ destroyers where algæ exist. To running streams the oil should be applied weekly. The oil kills the fish, but as they do not kill the larvæ "they have to go." (4) *Open ditches* are not satisfactory: "they breed a maximum of anophelines in a minimum of time." (5) *Blind Drains.* These consist of a flat stone laid on the

bottom of the ditch, a stone at each side, and a cover-stone on top. The top is filled in with stones of varying size. They work satisfactorily, and the cost of maintenance is *nil* except when they clog. (6) *Filling in of low ground.* Porous material such as ashes or gravel is used. It is necessary to dig a ditch sufficiently deep to cut off the sub-surface water. (7) *Tile drainage.* This is the most economical and effective method of destroying anophelines in the tropics. *Clearing of Vegetation.*—All vegetation within 200 yards or more of houses is removed. No detailed figures are given of the results of these extensive works, but for corresponding periods in 1908 the malaria cases sent to hospital were 75 per cent less than in the previous year.

Harding[2] describes "Koch's treatment" of malaria:—(1) On admission, all cases suspected to be malarial are given 5 gr. of calomel (unless there is any reason to the contrary), followed six to eight hours later by a small dose of saline. At the same time a blood film is made and examined. If parasites are found, 15 gr. of sulphate of quinine are given by the mouth (and if vomited the dose is repeated); if parasites are not found no quinine is given. This rule is strictly observed. (2) The following morning the dose of quinine is repeated (and a blood-film examined), and this is done on five consecutive mornings; the patient is then fit for discharge. (3) The after-treatment is then carefully carried out as follows: Further doses (15 gr.) are given on the tenth and two subsequent days from the first dose, and every tenth day after them for *three months.* The author regards this treatment of Koch's as the most marked therapeutic advance of recent years.

V. Raymond and L. Salignat[3] attach considerable importance to dyspeptic troubles in persons suffering from chronic malaria. Examining thirty cases they found that 53 per cent had hyperchlorhydria, 33 per cent were normal, and 13 per cent had hypochlorhydria. In these cases the following symptoms were present: (1) Frequently the spleen was sensitive and enlarged; (2) In all the liver was affected; generally it was sensitive to pressure, and it was frequently enlarged. (3) Hepatoptosis, enteroptosis, nephroptosis were sometimes present, with a marked fall in the intra-abdominal tension. When the action of other factors, such as alcoholism, bad food, tropical heat, fatigue, and quinine has been eliminated, there remains the preponderating influence of malarial infection in these cases. The authors consider that the dyspepsia is a secondary one of hepatic origin. As treatment, they recommend a "thermal cure" at Vichy.

A. Chauffard[4] has studied the spleno-hepatic syndrome in two cases of acute malaria, and shown that as the volume of the spleen *decreases* under quinine treatment, that of the liver *increases*; the liver becomes so to speak the receptacle for the splenic débris brought to it by the splenic vein. This increase in volume is only transient, and then the liver, like the spleen, subsides in those cases where quinine has killed the parasites. This reaction on the part of the liver is not purely a mechanical one, but is accompanied by glandular activity.

shown by cholæmia, subicterus, urobilinuria, intestinal polycholia with excess of stercobilin. The hepatic changes are still more serious if parasites from the spleen reach the liver capillaries unkilled by quinine; they include hepatitis, which may end in cirrhosis. In these cases the spleen also presents sclerosis of the pulp and perisplenitis, and there is also endophlebitis of the splenic vein. The author, in fact, considers the hepatitis as in the main dependent on the condition of the spleen.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* Dec. 26, 1908; [2]*Jour. R.A.M.C.* Sept. 1909, in *Ther. Gaz.* Jan. 15, 1909; [3]*Rev. de Méd.* Dec. 10, 1908; [4]*Sem. Méd.* Jan. 20, 1909.

MASTOID DISEASE. (*See* EAR, DISEASES OF.)

MEASLES. *E. W. Goodall, M.D.*

PATHOLOGY.—In the *Medical Annual* for 1908 attention was drawn to cases of *nerve affections* following measles. A case of this kind has recently been recorded by Busteed and Sadler.[1] The patient was a boy, aged 9, who on the fifth or sixth day of an attack of measles became paraplegic, and was unable to pass urine. The symptoms pointed to acute myelitis in the mid-dorsal region of the cord. In twelve days recovery commenced to take place; in four weeks the boy could walk with assistance, and in eight or nine he could walk and run, though somewhat clumsily. Ultimately complete recovery took place. The treatment consisted of **Rest, Catheterization, Electric Treatment** of the bladder, abdomen and lower limbs; and at first a mixture containing **Potassium Iodide** and compound tincture of **Cinchona** in moderate doses; later **Nux Vomica,** and finally **Easton's Syrup.**

DIAGNOSIS.—In an article on the condition of the gums in measles, Frank E. Tylecote[2] describes an intense gingival hyperæmia as being an early sign. The gums become intensely hyperæmic, red, injected, and slightly swollen. The gum is also injected here and there with a patchy whitish seam which is easily removed, and which consists of epithelial squames and débris. This injection can be seen as early as Koplik's spots, i.e., two or three days before the rash appears, while it persists longer than they do, even, in some cases, till the rash begins to fade. The condition is very easily made out, whereas in a small, struggling child it is not always easy to see Koplik's spots, especially when they are few in number. The injection is not to be seen in scarlet fever, rubella, or influenza.

Tylecote further states that in an epidemic of measles in which all the cases, fifty in number, came from one school, there was a well-marked marginal ulcerative gingivitis as a complication in 60 per cent of the cases. It came on during the third week. The treatment which was most beneficial was washing the gums with a solution of tincture of **Myrrh,** ½ oz., **Borax,** 2 dr., and water to 12 oz.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 16, 1909; [2]*Pract.* Aug. 1908.

MÉNIÈRE'S DISEASE.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

In a severe case of Ménière's disease which had not been relieved by the employment of the usual drugs, quinine, bromides, etc., a cure, according to Herzer,[1] resulted from **Vibratory Massage** of the nasal mucous membrane. The attacks of giddiness disappeared after six sittings only, the tinnitus went in two months with two sittings a week; the deafness, however, remained practically unchanged. Sixteen months later a slight recurrence of the symptoms took place, which was relieved in eight days. Seen two years later, the patient stated himself to be quite free from vertigo and to have only slight tinnitus. The favourable effect of treatment directed to the nose is to be ascribed to a reflex active hyperæmia of the head, and so to trophic changes in the nerves and nerve-endings.

REFERENCE.—[1]*Münch. med. Woch.* May 11, 1909.

MENTAL DISEASES.

Bedford Pierce, M.D., F.R.C.P.
Norah Kemp, M.B., C.M.

In two altogether different directions our knowledge of mental disorders has been increased recently. In both there is promise for the future. The advance in the one case is essentially physiological, in the other psychological. One demonstrates the causation of mental disease by toxins arising from the activity of micro-organisms; the other shows how mental disorders arise from purely mental causes. Hence, the one tends to strengthen the materialistic, tendency of medical education, showing how poisons attacking the nervous system produce a wide range of mental symptoms; the other demonstrates that long-forgotten memories may produce a series of morbid mental processes leading to definite pyschoses, without assuming the presence of any toxic or other material influence.

Such appears to be the effect upon psychological medicine, on the one hand of the brilliant researches chiefly associated with the name of Wassermann, which have done so much to clear up the relationship of syphilis and general paralysis, together with the important investigations of Orr and Rows, which have demonstrated the route by which toxins reach the nervous system; and on the other, the psycho-analytic method of studying mental symptoms introduced by Freud, of Vienna, and developed by his pupils.

From opposite sides advance has been made, and though the unknown interior seems as vast as ever, and the explorers have not come in sight of one another, yet we shall find, if we study their accounts, that progress has been made and fresh light thrown upon a dark continent.

Some reference must be made to the criticisms that have been directed against modern methods of classifying mental diseases. The controversy is chiefly concerned with the new conceptions introduced by Kraepelin or adopted by him from other German writers. The justification for giving serious attention to these is found in two directions, firstly, that Kraepelin's teaching is stated to be of real

help in diagnosis and prognosis, and secondly, his work has undoubtedly done much to stimulate clinical study.

The new classification traverses the old lines of cleavage in entirely new directions. The old groups—mania, melancholia, stupor, dementia —are split up into entirely new combinations. When the old terms are used they are frequently applied in a restricted sense, leading to much confusion. To illustrate this we will speak of mania. This term, a generation ago, connoted a state of excitement with exaltation, often associated with incoherence, violence, or degraded conduct, and it was subdivided into simple mania, acute mania, acute delirious mania, recurrent mania, chronic mania, and so forth. The mental states included under this term are now divided quite differently. One set of cases would be termed acute confusional insanity (amentia of some authors), another collapse delirium, a third set would be called dementia præcox, a fourth the maniacal form of maniacal-depressive insanity. It is claimed that these new groups represent forms of mental disorder which can usually be recognized clinically, that each represents a different symptom-complex, which, if not a nosological entity, is sufficiently definite to enable the physician to form some idea as to the probable course of the malady, whether relapse is probable, and the extent to which the recovery may be expected to be complete. Similar considerations affect states of depression, of enfeeblement, of chronic delusion, and it will therefore be seen that the new conceptions will not readily harmonize with the old ones. Kraepelin's classification has been adopted by Dr. Stoddart in his valuable book "Mind and its Disorders" (Lewis). It should, however, be pointed out that although Stoddart accepts a great deal of Kraepelin's teaching, his book contains much original work, and is itself an important contribution to psychological medicine.

The controversy about classification rages chiefly round the two syndromes dementia præcox and maniacal-depressive insanity, and below will be found a brief outline of objections that have recently been urged against the introduction of these terms. Happily, in this country at any rate, new hypotheses are not accepted without careful investigation, and it will be found that many authorities take a distinctly conservative attitude.

A noteworthy and important book has been translated from the Italian by Drs. Orr and Rows, "Modern Problems in Psychiatry," by Ernest Lugaro (University Press, Manchester) dealing with almost all the branches of psychological medicine. Throughout there is a tone of healthy optimism, its key-note is the encouragement of research, and it is full of a true scientific spirit. Another valuable translation from the Italian is Professor Tanzi's book on mental diseases (Rebman), by Drs. Ford Robertson and T. C. Mackenzie.

The past year has been memorable on account of the Report of the Royal Commission on the Care and Control of the Feeble-minded. The proposals, some of which are mentioned later, would do much to prevent the multiplication of the unfit, and would at the same time

prevent much epilepsy, alcoholism, and crime. Although the cost to the State would be large, in the opinion of many there would be much saving in other directions, and it is possible that, in the long run, the proposals may be found to be economically sound.

Many signs point to increasing interest in psychological medicine as a scientific study. Much valuable work is being done, research in this most difficult branch of medicine is being undertaken with increasing enthusiasm in our own country, and the future of psychiatry in the British Isles is full of promise.

General Paralysis of the Insane.

The causation of general paralysis is a question of great social importance. In recent years much has been done to elucidate the problems which surround this subject, and modern research has enabled a step to be taken towards settling the vexed question as to the relation between general paralysis and syphilis. Moreover, the histological features of the disease have been more completely differentiated from those in other conditions; clinically, lumbar puncture has been found a valuable aid in diagnosis. A review of the present state of our knowledge is given by Ernest Jones,[1] who deals with the histological and the biochemical advances that have been made recently The changes which, he points out, take place in the lymphatic sheath in the adventitia, are significant in relation to the important researches of Orr and Rows,[2] by which it has been shown that toxins reach the central nervous system by the lymphatic channels. Lesions identical in type with those found in tabes dorsalis and general paralysis have been experimentally produced. The method employed consisted in placing a celloidin capsule, filled with a broth culture of an organism, under the sciatic nerve or under the skin of the cheek, and there was found invariably a degeneration of the brain or spinal cord according to the situation of the capsule. It was shown that the toxins ascended the perineural sheaths of the peripheral nerves, and on reaching the central nervous system produced the characteristic changes referred to. These experiments are most suggestive as an indication as to the route along which the poisons producing general paralysis reach the brain and spinal cord.

The examination of the cerebrospinal fluid has also thrown much light upon the nature of this disease. On the whole, recent work confirms the views of Wassermann as to the relation between the changes in the fluid in general paralysis and those found in syphilis (*see* Syphilis). It was at one time considered that an increase in the cytological elements in the cerebrospinal fluid was an almost certain indication of either syphilis or general paralysis. In the normal fluid, cells are few in number, not more than five to the cubic millimetre, and they are usually lymphocytes. In syphilis the number is increased, but in tabes and general paralysis the increase is frequently very considerable, moreover, the kind of cell changes, and in addition to the lymphocyte, polymorphs, plasma cells, phagocytes, and mast cells

may be found. The mere increase of cells in the cerebrospinal fluid is found not to be of great significance, and Scott Williamson[3] has found a large increase in other forms of insanity. There is also leucocytosis in meningitis. The chemical analysis of the fluid is claimed by some to give a valuable indication as to the existence of tabes or tabo-paralysis, there being a considerable increase in the amount of proteid, and the presence of a substance called euglobulin, which is believed to play an important part in the Wassermann reaction. Scott Williamson, however, does not consider the alteration in the proteid of much importance in diagnosis, and he finds it in epileptic insanity, acute mania, and some other diseases.

Authorities are, however, agreed as to the trustworthy results obtained by the Wassermann reaction in the examination of the cerebrospinal fluid. Ernest Jones states the reaction is positive in 95 per cent of the cases. Scott Williamson obtained positive results in 19 out of 22 cases, and in half his cases of tabes; and Candler, quoted by Mott,[4] says the reaction was positive in 89 per cent, and in none of the control cases was there any response. Williamson has found the Noguchi test fully as trustworthy as the former, and in no case did it give a positive result other than in general paralysis, tabes, syphilis, and optic atrophy. This test is much simpler than Wassermann's, and Mott describes the process as follows : 0·2 cm. of cerebrospinal fluid is boiled for a few seconds with 0·5 cm. of 10 per cent butyric acid solution of 0·9 per cent sodium chloride, and then, adding 0·1 ccm. of normal solution of caustic soda, it is boiled again very briefly. A flocculent precipitate is obtained in parasyphilitic affections. It is important to be sure that there is no contamination with blood.

A third test has been introduced by Porges and Meier, founded on the observation that by the addition of lecithin, certain substances were precipitated from serum obtained from syphilitic persons. Mott considers it less trustworthy than the Wassermann reaction. Williamson has found that the Porges-Meier reaction failed in four cases of general paralysis, also in one case of cerebral syphilis and two of optic atrophy. It, however, was negative in 18 cases of other forms of insanity, in 5 normal persons, and gave a positive reaction in 18 cases of general paralysis, 1 of tabes, and 2 of cerebral syphilis.

The general question as to the relationship between syphilis and tabes and general paralysis is discussed at length by Mott in the Croonian lectures.[4] There is no doubt that the doctrine " no syphilis, no tabes " has received striking confirmation by recent methods of investigation. The essential unity of tabes dorsalis and general paralysis is also strongly indicated. Conclusions formerly reached by observations and statistical enquiries have now been confirmed by experiment, and there seems no reason to doubt that general paralysis of the insane depends upon antecedent syphilis, either acquired or inherited. Up to the present, however, there is no reason to think that the micro-organism which is the cause of syphilis (*Spirochæta pallida*) is the direct cause of these nervous diseases.

The spirochæte is not found in the cerebrospinal fluid. How the nervous system becomes attacked, and why anti-syphilitic remedies are of no avail, is at present unknown. Mott considers that the "various types of parasyphilitic disease are the results of primary neuronic dystrophy. . . . . In tabes dorsalis the spinal sensory proto-neurons are affected, in general paralysis the cortical association neurons. . . . . The dystrophic process is due to lack of durability of the neurons; it may be a slow process of decay and death of the intraspinal portion of the sensory protoneurons, as in the case of tabes dorsalis; it may be a rapid process of decay and death of systems and communities of neurons in the brain, as in general paralysis." Mott discusses also the uncertainty of the incidence of nervous affections after syphilis, and asks why only about 3 to 5 per cent of the persons infected subsequently suffer from one of these forms of nervous degeneration? He is disposed to think that the variation is probably less dependent upon variation of the virus than upon the resistance offered by the organism.

The views of the authors previously mentioned are largely in harmony with those of Max Nonne, the second edition of whose work on syphilis and the nervous system is reviewed by Dr. Eden Paul.[5] Nonne is disposed to accept the opinion that the poison of syphilis has a direct affinity with the nervous system, producing a *lues nervosa*. He quotes Ehrmann, who found spirochætes in great numbers in the nerves passing from tissues affected with Hunterian chancre. There is, therefore, an analogy between syphilis in its effects upon the nervous system, and leprosy, hydrophobia, and sleeping-sickness. Nonne believes general paralysis to be more prevalent than formerly, that it tends to appear at an earlier age, and that a greater proportion of women are attacked. He does not appear to subscribe fully to the doctrine "no syphilis, no tabes," or general paralysis, although he thinks syphilis of overwhelming importance in the development of these diseases. In discussing the failure of anti-syphilitic remedies to produce benefit in general paralysis, Nonne does not consider this failure has necessarily any bearing upon the question, and he points out that antitoxins do not affect post-diphtheritic paralysis, and it is not doubted that this nervous disease is due to diphtheria. Incidentally it may be mentioned that Nonne considers syphilis to be a factor in the production of many different psychoses, in particular epilepsy, mania, dementia; but he does not consider there is a special form of mental disease with distinctive characteristics to which the name syphilitic insanity could suitably be given.

Reference must be made to the researches of Ford Robertson, Macrae and others, as to the diphtheroid organisms which they have isolated from cases of general paralysis, and which they consider of etiological significance. The reader will find it difficult to reconcile the teachings of Wassermann, Noguchi, Mott, and large numbers of other workers with the views expressed by Ford Robertson and Macrae; the only point upon which all are agreed is that general

paralysis is due to a toxin developed through the activity of some micro-organism.

Ford Robertson's earlier articles[6] advance the hypothesis that this disease is due to the invasion of one of two diphtheroid bacilli, *B. paralyticans longus* and *B. p. brevis*. He claimed that rats and mice fed on these bacilli, obtained in the first instance from cases of general paralysis, developed acute or chronic forms of a disease closely resembling general paralysis, and their nervous systems exhibited lesions similar to those formed in that disease. Ford Robertson and Macrae, moreover, have prepared vaccines which they claim to have a remarkable effect upon the course of the disease. The vaccines were derived from cultures of the diphtheroid bacillus obtained in the first place from patients suffering from general paralysis. They report extraordinary improvement following the administration of the vaccines, even in bed-ridden patients who have reached the third stage of the disease. It must, however, be remembered that in ordinary course, remissions are very common in general paralysis. Its course, although downhill, is rarely a steady decline, but usually an undulating path, with many ups and downs.

In the discussion which followed the reading of Dr. Ford Robertson's paper, Dr. Winifred Muirhead stated that she had isolated the diphtheroid bacillus in 16 out of 52 cases of general paralysis, and had also found the identical bacillus in 7 out of 20 cases of acute delirious insanity. The vaccine treatment of the general paralytics with their own organism gave a negative result. She concludes that the diphtheroid organism is not the cause of either the general paralysis or the delirious insanity.

In a paper published in October, 1909, Ford Robertson[7] presented further evidence on this subject. Four rabbits were fed with cultures of the long variety of the same bacillus, and one of them developed well-marked paresis, as well as a dullness and want of alertness indicating some cerebral affection. Experiments with intraspinal injections of cultures of the same bacillus were also related, in which marked signs of paralysis appeared, and the histological changes found after death appeared to be exactly of the same character as those occurring in general paralysis.

In criticism of this hypothesis much has been said, and many authorities have doubted whether the bacilli in question have the specific characters attributed to them. It has, moreover, been suggested that they are in reality due to a terminal invasion, essentially dependent upon enfeebled powers of resistance.

G. S. Williamson[8] has brought forward a series of experiments which, he claims, controvert the etiological significance of the bacilli described by Ford Robertson, although they in no way attack the fundamental theory of a toxic cause acting through definite lymphogenous channels, as established by the work of Orr and Rows. He says the bacilli described by Robertson are widely distributed, are common in the nose and throat; that they may give rise to disease of

a chronic nature affecting the nervous system; but that this does not prove its specificity in general paralysis of the insane. He claims that the blood serum of persons affected by these bacilli gives the serum responses typical of bacillary infections, but that the serum of general paralytics does not give these responses. He concludes that the bacilli in question may be a considerable factor in secondary infections of many general paralytics, as they tend to flourish where there is a lowered resistance, but that they are not alone in this respect.

Dementia Præcox.

Much controversy has taken place in this country respecting dementia præcox. In America, the conception of Kraepelin and others that dementia præcox, if not a nosological entity, is a syndrome of sufficient importance to deserve a special place in our nomenclature, is widely accepted, whilst in France, Italy, and Germany the term is commonly used. British alienists are, however, by no means united, and the divergent opinions upon this subject were expressed in a discussion which occupied the greater part of two meetings of the Medico-psychological Association.[9] Dr. Robert Jones and Dr. Urquhart adversely criticized Kraepelin's generalizations, and Dr. Thos. Johnstone and Dr. Stoddart defended them. The words dementia and præcox were both stated to be objectionable. In England, at any rate, dementia is understood to connote incurable mental decay, and its use, when applied to cases which sometimes recover, is misleading. The word præcox, in the sense of precocious or premature, is unfortunate when applied to illness that is said sometimes to appear late in life. It must, however, be remembered that in Germany dementia is not used in the restricted sense usual in England. The criticism which carried most weight referred to the absence of any distinctive pathological findings, and until a definite pathology can be demonstrated, it is difficult to consider any disease a morbid entity.

Considerable discussion centred round the relationship between adolescent insanity as described by Dr. Clouston years ago and the modern conception of dementia præcox. Some authorities preferred the older term, and thought it quite as useful from a clinical point of view; others considered the two aspects of the question did not at all coincide. In adolescent insanity, as originally described, the recovery rate is high and the prognosis favourable in a considerable majority of cases; in dementia præcox the recovery rate is very low, 8 per cent or under. It therefore seems clear that the two terms either overlap in meaning or refer to different forms of mental disorder.

The vagueness of the descriptions of dementia præcox, and the fact that the particular symptoms described as characteristic are also found in psychoses of a different nature, were pointed out by several speakers. Also attention was drawn to the extension of the original conception to include paranoid cases, and consequent loss of definiteness in the clinical picture. It was suggested that the three subdivisions, hebe-

phrenia, katatonia, and paranoid dementia, were themselves definite diseases, and that the inclusion of them all under one head is unscientific and misleading. On the other hand, several speakers alluded to the value of the conception of dementia præcox in actual practice, the assistance it gives in prognosis, and it was pointed out that the term has given a great impulse to the study of insanity. Others considered the term a useful one provisionally, but did not think there was sufficient evidence to justify looking upon dementia præcox as an entity.

Symptomatology.—Smith Eli Jelliffe[10] says that dementia præcox stands for "a group very clear as to its nuclear features, but misty in its outlying edges, and far from constituting an unassailable synthesis." In discussing the symptoms of negativism he accepts the view that there is interference or retardation of the immediate consequence of the primary idea; there is consequently no deliberation, but an abnormal activation of the contrary impulse, so that negativism, impulses, or obsessions prevail. The psychological development of the symptoms is discussed, and he appears to accept the view that these are due to the breaking down of associations of many years' growth, leading to "emotional dementia" and to "intrapsychic ataxia." He quotes Kraepelin as saying that 70 per cent of cases show definite hereditary taint, and in 17 per cent, one or other parent is involved; and also Vorster, who found 36 per cent hereditary in 1000 cases of dementia præcox. His own experience shows three hereditary factors: alcohol, dementia præcox itself, and abnormal crankiness. The evil effects of mental overwork in unstable children is described, especially the irritability, rudeness, and sleeplessness; the anxious tendency, so that the child is always working, and he points out the importance of our early recognition of these and other signs of fatigue. He quotes Christian and others in France as stating, "When an ill-directed ambition has stimulated children of psychically poor rural stock to take up intellectual pursuits in the urban centres, dementia præcox is not an infrequent result."

J. W. de Bruyn[11] has made a study of emotional expression in dementia præcox. All the patients selected exhibited the usual signs of indifference, and were deficient in emotional expression and appreciation of emotional states. The responses selected were respiratory and vasomotor, recorded with suitable instruments automatically. A brief description of the eleven cases experimented upon is given. Of these patients, only two could be regarded as obtuse in their responses, and these were mild cases. In 177 experiments made on patients who showed practically no sign of emotion as judged by ordinary tests, there were 121 which showed some response. It appeared that the unresponsiveness in dementia præcox extends to the voluntary muscles alone, and is not at all marked as far as the involuntary actions are concerned.

Treatment.—Jelliffe (loc. cit.) says "the big stick" is most dangerous in such unstable personalities. "With inevitable fatality

it drives the boy from home to vagabondage, bad hours, vicious company, and precocious dementia." The lines of education are a simple out-door life, manual training instead of bookwork, careful teaching of manners; sports, but not too strongly competitive. Mathematics, dramatics, and competitive intellectual pursuits are considered harmful. Agriculture is a valuable occupation, and in not a few cases it results in the restoration of mental health.

Maniacal-Depressive Insanity.

Kraepelin's far-reaching generalization, that the conditions known as mania and melancholia are frequently to be regarded as different manifestations of one disease, so closely corresponds with clinical experience, that it is not surprising that his teaching has met with a favourable reception. Maniacal-depressive insanity, the name given by Kraepelin to this disease, is described by him under three forms: maniacal, depressed, and mixed. Many authorities do not follow Kraepelin in his restricted use of the term melancholia, in which it is limited to states of depression occurring after the prime of life, associated with apprehensiveness and anxiety, the melancholia of involution. Many feel that it is not possible to differentiate these cases from other forms of depression. Lugaro,[12] whilst generally sympathetic towards the conception maniacal-depressive insanity, points out that maniacal and melancholic syndromes are observed in old age, as episodes in the course of dementia, in some forms of imbecility, and in the initial stages of dementia præcox. The extreme difficulty of distinguishing certain cases of this last-mentioned syndrome from maniacal and melancholic states is also mentioned, especially as periodicity is frequently a prominent feature in both.

This subject was discussed at a meeting of the Irish division of the Medico-psychological Association,[13] and almost all the speakers criticized adversely the introduction of the term maniacal-depressive insanity. M. J. Nolan stated that cases met with in practice do not correspond with the clear-cut descriptions of the maniacal and depressed forms, and that it is only when the "mixed" form is considered that the clinical picture corresponds with Kraepelin's account. He considered that the individuality of the patient materially affects the character of the symptoms, so that in practice the attempt at classification breaks down. He concludes that "the 'mixed form' is the only form worthy of acceptance. It alone can be diagnosed from a single attack. . . . . The incidence of the 'mixed form' attacks is intimately associated with the stress of the age epochs, with toxic influences (alcoholic, etc.), and with sexual excesses."

Jas. Cotter gave a report on thirty-one cases of maniacal-depressive insanity. The age at the onset of the first attack was under 25 in 22·5 per cent of cases; over 25 and under 35 in a like percentage; over 35 and under 55 in 38 per cent. The sexes were attacked equally, and in no cases did the attack occur in connection with pregnancy or the puerperal state. The generally received opinion that, in this form

of mental disorder, hereditary predisposition is strongly marked, is confirmed by Cotter's results. In the cases under review, 70·9 per cent disclosed a decided insane history, whereas of the total number of patients admitted during the year, only 42·4 per cent came from an insane stock.

Drapes also took exception to the use of the term maniacal-depressive insanity, and pointed out apparent inconsistencies in the descriptions of this disease in Kraepelin's clinical lectures translated by Dr. Johnstone. He maintained that the whole rests upon "a fallacy of regarding any mere grouping of symptoms as a distinct disease entity." He believes it is useless to attempt to found any system of classification upon symptomatology. In particular, he considers that the "impediment of thought and volition," which is stated to be a characteristic symptom of the depressed form, is in no sense distinctive, as it occurs in many forms of mental disorder, in dementia, in adolescent insanity (dementia præcox), in post-epileptic cases, and in insanity following acute diseases.

There is, however, no doubt that in America and on the Continent Kraepelin's classification of mental disorders is accepted much more widely than these criticisms would lead one to expect. To mention but one recent publication, "Les Folies Intermittentes,"[14] by Drs. Denny and Camus, it will be found that Kraepelin's views are accepted and traced to Fabret's description of *folie circulaire* in 1854. These French authors also accept Kraepelin's description of the melancholia of involution as being distinct from maniacal-depressive insanity.

Clinical Psychiatry.

"The Leucocyte and the Acute Insanities" is the title of an essay by Colin McDowall,[15] which was awarded the bronze medal of the Medico-psychological Association. His cases were 48 in number, and divided into two groups, which he termed excitement with confusion (acute mania), and depression with excitement. In the former he found that leucocytosis is invariably present in recent cases, the average limit of increase being between 10,000 and 16,000. It fluctuates and frequently falls, but as convalescence approaches there is a secondary rise. He looks upon the leucocyte as the natural antagonist of infection, and considers the rise in question represents the resisting powers of the patient. In secondary attacks, or in aged people, there is less marked leucocytosis, and the prognosis is not so good. There is an increase in the polymorphonuclear cells, rising to 80 or 90 per cent. In excitement with confusion the eosinophile cells may also be increased in number, but rarely to a great extent. In depression with excitement there is also a marked leucocytosis, and the polymorphonuclear cells are increased in number. There is, however, usually a decrease in eosinophile cells. The reasons why the micro-organisms responsible for these acute insanities have not been isolated are also discussed; it is suggested that they may be localized in some part of the body and difficult to differentiate from

other bacilli found in these situations, or possibly the organism is extremely difficult to cultivate except in the blood of man.

A method of treatment is suggested, and two illustrative cases are quoted, in which an artificial leucocytosis is produced by the administration of **Nuclein** or **Ceredin,** and Eyre's experiments on the effect of the latter upon the staphylo-opsonic index is referred to. Ceredin is a fatty constituent of yeast, and is free from nuclein substances.

In the case of excitement with confusion quoted, 0·05 gram of ceredin was given three times daily for 17 days, and then 0·75 gram was given in like manner. There was an increase in the polymorphonuclear leucocytes, and the patient eventually became convalescent. The other patient, who was depressed and excited, had originally a hyperleucocytosis of 30,000, but it gradually fell in five months to 13,000. Nuclein was given without any marked result. Cereden was next given, 0·1 gram daily, increased to 0·2 gram. In two days the leucocytosis was 16,000. This treatment was continued for a month. After a fall in the percentage of white cells, the patient began to improve mentally, and is convalescent.

McDowall considers the blood examination of great value in prognosis. In excitement with confusion, in "primary cases that make a good recovery there is found at the commencement of the attack a leucocytosis which is over 10,000 but below 20,000 per cmm. Another constant feature is an eosinophilia found early in the disease, whilst the polymorphonuclear percentage is about 80, or even higher. . . . . A marked hyperleucocytosis unaccompanied by any eosinophilia is of bad outlook. The patient is, as it were, overwhelmed by the toxin, not, however, without making a considerable, though insufficient, resistance. . . . . In secondary attacks the leucocytosis is seldom high. In these cases an eosinophilia is a sign of good prognosis, and more especially if the polymorphonuclear percentage is raised."

In depression with excitement, "hyperleucocytosis demonstrates the extreme virulence or excessive amount of the toxin; the reverse, leucopenia, the lack of resistance of the individual. As long as the leucocyte count keeps up, the outlook must be considered hopeful. . . . . The most favourable phenomenon is a moderate leucocytosis with high polymorphonuclear percentage, which gradually diminishes as the acute symptoms pass off, but which always keeps above normal."

Psycho-therapeutics.

Psycho-analysis.—In introducing the subject of psycho-analysis, it will be convenient to quote extracts from the able summary of the subject given by Ernest Jones.[16] "The psycho-analytic method we owe almost completely to the genius of Prof. Freud, of Vienna, who in the past sixteen years has wrought it into an elaborate science. . . . . The method is based on the knowledge that the symptoms present in the psycho-neuroses owe their origin to a conflict between

two groups of ideas or mental processes, which cannot be brought in harmony with each other. One complex of mental processes is for some reason or another of such a kind as to be inacceptable to the main body of the personality. The personality fails to assimilate it, will have nothing to do with it, tries to forget it, to submerge it, to repress it. The repressed complex then takes on an automatic existence, and acts as an irritating foreign body. . . From this point of view we may define the pathology of the psycho-neuroses as a defect in assimilation."

The repressed mental processes are sometimes called "buried complexes," and may be ideas, strivings, wishes, impulses, and they commonly relate to the sexual life of the individual. They may have been quite forgotten, and the patient may be unaware that they have anything to do with their present symptoms. Yet the repressed complex may be the cause of mental disturbance apparently unrelated to the original wish or impulse, and one of the chief difficulties of the psycho-analytic method is the unravelling of the history and tracing to its cause the obsession, phobia, or other symptom from which the patient suffers. Psycho-analysis appears to be of especial service in psychasthenia, in tedious intractable cases presenting doubts, fears, obsessions of all kinds, tics, and the condition called "conversion hysteria" by Freud. The theory assumes that the buried complex is of the nature of a wish or desire which has been rejected as impossible or improper. "The stream of feeling that characterizes the wish is dammed up, it can find no direct outlet, and so flows in an abnormal direction." The outlet may be in a purely mental direction, and leads to the development of an intellectual obsession, or it may be expressed physically in a tic or spasm. In either case the symptom when developed provides a certain amount of unconscious gratification, and neither the patient nor the observer is able to understand its significance.

The discovery of the morbid mental processes is a matter requiring much time and patience. Several methods of investigation are used to disinter the buried complexes—hypnotism and the hypnoidal state, the method of free association, a study of mannerisms, word reactions, and an analysis of dream memories. Many of these require the application of technical methods of investigation not easily acquired without special study. The aim, however, is to trace the development of the morbid complexes and then "give the patient a deeper insight into the workings of his mind, so that he is able to correct abnormal deviations, to overcome internal inhibitions and impediments. . . . . He is in this way able to free his personality from the constraining force of these complexes, and, by taking up an independent attitude towards them, to gain a degree of self-control over his aberrant thoughts and wishes that was previously impossible. . . . The training received by the patient is thus educative in the highest sense of the word. . . . He grows in capacity to know and in ability to do."

The results obtained by this method are stated to be very satisfactory,

but there are several weighty objections. The method involves an extraordinary amount of time. Freud states it is often necessary to devote to a patient an hour a day for three years, although in mild cases benefit accrues after a few months. Next, the training required in the technique of the examination is laborious, and Ernest Jones states it is generally admitted that three years' practice is required. Many physicians, moreover, deprecate strongly the revival of past unpleasant memories in the way suggested, and think it is better that they should remain buried and forgotten. Freud appears to assume that almost all psychasthenic symptoms depend upon some past sexual experience or wish. The disclosure of these is unpleasant to both patient and physician, and one naturally hesitates to embark upon a series of close enquiries upon subjects involving the representation in consciousness of prurient details, and the serious possibility that unsuitable thoughts may be suggested to the neurotic, impressionable person under examination.

Sadger[17] in the main strongly supports the therapeutical value of Freud's method of psycho-analysis. He states that "behind every symptom of hysteria and obsessional neurosis lie concealed a mass of sexual wishes," and he claims that when hysteria is thus understood no one who properly grasps the technique of the psycho-analytic method will fail to cure it in every case. He also states that it requires three years properly to master this technique.

Morton Prince[18] speaks with approval of the psycho-analytic method of treatment in many cases, but he does not agree with Freud's explanation of its success. He looks upon it as a special form of educational treatment.

Walter D. Scott[19] admits the value of the method, and states that the results are generally admitted as unquestionable. But he does not accept Freud's theory that the morbid symptoms are due to buried complexes. He considers that "the psycho-analytic method is nothing more than a skilful application of suggestion, and that it offers no proof of subconscious complexes of supposed emotional ideas." He relates a severe case of phobia in which the patient had a great dread of being in any strange place. Treatment was begun with hypnotic suggestion, latterly by suggestion in an hypnoidal state, but complete recovery did not take place until distressing sexual experiences were elicited, which confession was obtained in the waking state. The view of the case urged is that by assuming the theory of suggestion instead of subconscious complexes the treatment was varied and apparently rendered more successful than it could have been by the application of Freud's theory to such a case.

Hypnotism.—Geo. H. Savage, in the Harveian oration, 1909,[20] stated that he believed a real advance would attend a calm consideration of the facts connected with hypnotism. He said he began with doubt, passed into a stage of indifference, and had reached a stage of hope. He had found hypnotism of no use in the treatment of the actively insane. The objections to hypnotism and the possible dangers

attending its use were discussed, and the opinion expressed that it is well to avoid its use in highly neurotic people. He considered " that nervous disorders that do not depend upon organic brain disease, those mental disorders which are purely functional, and such as do not cross the insane border line, may be benefited." The possibility of alleviating symptoms such as the relief of pain or sleeplessness was held to go a long way towards the cure of disease. The value of hypnotism in the treatment of drunkenness and drug habit, stammering, enuresis, hysterical palsies, and spasm was specially mentioned. In respect to drunkenness, Dr. Savage stated that he had seen cases which had recovered by suggestion in the hypnotic state in which the disadvantages of drink were emphasized ; he had also seen patients who had been cured by post-hypnotic suggestion to the effect that drink is disagreeable. " It must be recognized that when the subject does not freely accept the treatment, no therapeutic result will follow." "Hypnotism is useful often in very different morbid states, relieving symptoms, whether due to simple or organic causes. The most suitable maladies for hypnotic treatment, then, are the neuroses—nervous complaints in which no anatomical cause is demonstrable. This list includes many pains, skin irritability, spasms, tremors, and the like. . . . . Even in organic disease, such as tabes and apoplectic paralysis, improvement seems to result, and in some forms of obstinate vomiting, especially that associated with nervous anorexia, hypnotism is very beneficial." He stated further that he had no doubt that patients recover completely from mental obsessions, dreads, doubts, fear of poison, phobias of all kinds. Some of them lose them rapidly, almost instantaneously, but in other cases they seem to be slowly relieved.

Alexander Francis[21] relates a remarkable case of a lady, aged 81, who for thirty years had obstinate constipation, for fifteen years glycosuria, which persisted in spite of strict diabetic diet, and more recently a severe paroxysmal cough. After trying every conceivable form of treatment for the constipation, she was treated by Dr. Lloyd Tuckey by hypnotic suggestion, with immediate relief. Next the cough disappeared after a single treatment, and finally the glycosuria, when treated in the same way, was greatly improved. A series of analyses by an independent chemist showed a reduction of sugar from 36·35 gr. per oz. to 3·11 gr.

J. Milne Bramwell,[22] discussing " Obsessions and their treatment by suggestion," relates a series of striking cases in which obsessions had disappeared after hypnotic suggestion, viz., cases of incontinence of urine, fear of somnambulism, dread of open spaces, of heights, of fire, of having defrauded the revenue, alcoholism arising from obsessions, impotence, sexual imperative ideas, fear of insanity, etc As to the nature of obsessions, he states that in his own cases fear has been the predominating element, and in most cases there is marked mental agony. Accepting Morel's statement that in typical cases of obsession the patients fully recognize the absurdity and unreasonable-

ness of their ideas, the author states : "Obsessions undoubtedly have a tendency to become insane delusions. Thus the dread of acquiring cancer in one case passed into the fixed belief that it existed. In other instances fears of having injured others became delusions that such injury had been done." In his experience none of the patients who dreaded yielding to impulses to injure others ever gave way to them ; but he knows of cases in which the agony of striving to resist their obsessional ideas has caused patients to take their lives in order to escape from them. With reference to prognosis, Bramwell states, "In no class of functional nervous disorders have I had better results than in the treatment of obsessions. In every instance where the malady has been of quite recent origin, the recovery has been rapid and complete." In dealing with the prevention of obsessions, stress is laid upon the proper education of children. "Most children have suffered at one time or another from obsessions. Few people seem to realize the vividness of imagination in children and the sensitiveness to criticism. Many parents frankly discuss their children's failings with others, in their children's presence, and a morbid self-consciousness is often developed in this way which is never lost in after life and which entails great misery. . . . . Fear and self-analysis are the things above all others most likely to be mentally hurtful to a child."

Hospital Treatment of Incipient Insanity.

Speaking at the 1908 meeting of the British Medical Association,[23] Bedford Pierce dealt with the treatment of incipient insanity, and advocated the use of special wards in our general hospitals for this purpose, so that the poor might have a chance of recovery without being committed to asylum care. In Scotland, where power exists to detain patients for a limited time, special hospital wards are already available in certain places, with the result that every year large numbers of patients are treated to recovery without certification. The chief objection to asylums is this necessary certification, and the consequent prejudice against anyone who has been formally declared to be of unsound mind. Yet at present there is no other way by which a person suffering from mental disorder can be adequately treated. The result is that much valuable time is lost, for patients are not certified and placed under care until every possible alternative has been exhausted. He points out that something must be wrong with a system which virtually prevents patients from securing efficient treatment in the early stages of an illness. This applies more especially to the poor, for the rich can be treated in nursing homes or can voluntarily place themselves under care in private asylums, and thus stand a chance of recovery without certification and consequent loss of civil rights. In America they are erecting a psychopathic hospital of about 120 beds within the city (Boston), in association with Harvard University. The idea is to receive here all patients for care, observation, and examination, preliminary to suitable distribution to the custodial and infirmary branch and colony. All curable cases

would remain in the hospital, which would be the centre of the higher medical and scientific work, with an adequate staff of physicians and ample facilities for research. The physicians would be stimulated by contact with investigators and teachers in other departments of medical science. Should such a hospital be erected in this country and the usual legal formalities be necessary before patients could be admitted, the new institution would be little better than the old, as far as allaying prejudice went. The question naturally arises as to whether the patients could get sufficient fresh air in the heart of a great city, and whether it would be wise always to associate the acute with the acute. Edwin Goodall, in a paper on this subject,[24] reminds us that Bethlem Royal Hospital and St. Luke's are both situated in the heart of London, yet their recovery rates compare perfectly well with those of asylums situated in the country.

Bedford Pierce urges that special wards, or pavilions attached to our general hospitals, should be provided, so that mental patients might be able to obtain treatment earlier, which in some cases would be the means of preventing the development of an acute illness. Many cases would thus escape certification and its attendant civil disability. If inevitable, certification would at least have been delayed as long as possible, and there would be less separation from home and family. Such an arrangement would have a beneficial effect on medical education, as the medical student, if the hospital were attached to a university, would thus have an opportunity of examining unconfirmed cases early, and of studying the perplexing problems connected with borderland cases. Research would be stimulated, resulting perhaps in a more rapid increase of knowledge of psychological medicine. Much may be hoped for in this direction as a result of Dr. Maudsley's generous donation to the London County Council.

Dr. Helen Boyle[25] describes the excellent work done in the small hospital for incipient mental cases which she started at Brighton. This hospital contains 10 beds and 2 cots. Patients come from all parts of the country, and are drawn from all classes of the community. Cases of any form of nervous breakdown are admitted, and apparently do very well, the recovery rate being between 40 and 50 per cent.

The Care and Control of the Feeble-minded.

Considering the large part played by enfeeblement of mind in the production of paupers, alcoholics, and criminals, it is not surprising that the exhaustive report of the Royal Commission on the Care and Control of the Feeble-minded should have roused so much interest. For the first time a comprehensive scheme is proposed for the efficient care and control of the mentally deficient throughout the kingdom. In view of the serious consequences arising from the continual propagation of the unfit through weak-minded mothers, the value of the report is very great. It is to be earnestly hoped that the necessary legislation to enable its recommendations to be carried out will not be long deferred. Some of the recommendations (vol. 8, part xi) are

of special interest. The Commission state that it is not intended that the mentally defective, or epileptics not mentally defective, should be maintained at the public cost when they can be provided for suitably and sufficiently by their relatives and friends. It is proposed to institute a " Board of Control," which would be the one central authority for the general protection and supervision of mentally defective persons, and should regulate the provision made for their accommodation and maintenance, care, treatment, education, training and control. This Board of Control would absorb the Lunacy Commission, and would undertake the duties of the Lord Chancellor's Visitors in Lunacy. It would include a certain number of medical men with expert knowledge of the subject of mental defectives, barristers-at-law, a paid chairman, and honorary members, of whom one at least should be a woman. The Lunacy Acts of 1890 and 1891, and the Idiots Act of 1886 would be remodelled, and with the addition of new statutory provisions necessary to bring the complete scheme into operation, a new Act for the care and control of the mentally defective would be constructed. It is recommended that the statutory word " lunatic " be discontinued and " hospital " substituted for " asylum."

It is proposed that the term " mentally defective " shall include : (1) Persons of unsound mind, i.e., the insane. (2) Persons mentally infirm, i.e., persons who through mental infirmity arising from age or the decay of their faculties, are incapable of managing themselves or their affairs. (3, 4, 5) " Idiots," " imbeciles," and " feeble-minded," i.e., persons so deeply defective in mind from birth, or from an early age, that they are unable to guard themselves from common physical dangers, or are incapable of earning their own living, or who might be able to do so under favourable circumstances, yet cannot compete on equal terms with their normal fellows, or are incapable of managing themselves or their affairs with ordinary prudence. (6) " Moral imbeciles," persons who from an early age display some mental defect, coupled with strong vicious or criminal propensities, on whom punishment has little or no deterrent effect. (7, 8, 9) " Epileptics, " inebriates," and " deaf and dumb " and " blind," i.e., persons who, being epileptic, or inebriate, or deaf and dumb or blind, are also mentally defective.

The Commission hold that it is not on account of their pauperism, but because of their mental condition, that these people have a claim to State aid, and that this aid should therefore reach them, not through the Poor-Law and the Poor-Law guardians, but through a local authority—the council of each county and the council of each county borough, who shall make suitable and sufficient provision for them. Such provision involves the care and control of the mentally defective in institutions, homes, or houses, in observation or reception wards, or under family guardianship, or in any other way of which the Board of Control shall approve. The local authority is to exercise its powers through a statutory committee, one member of which at least shall

be a woman, and is to appoint a specially qualified medical officer or officers to assist them; but these new appointments shall not affect the internal management of the institution.

In the case of a person mentally defective under 21 years of age, and for whose care and control any council is responsible, and who is not already under suitable parental or other control, and who is not receiving suitable training, or is cruelly treated or otherwise neglected, the Committee shall assume the care and control of that child until of age, if, in the opinion of the responsible medical officer of the committee, such a step is necessary. Also any persons under 21 years of age, mentally defective, may be placed in suitable institutions upon one medical certificate without the intervention of the judicial authority, and on attaining the age of 21 years may, with the consent of the Board of Control, be further detained.

Dealing with the causation of mental defect, the Commission state that feeblemindedness "tends strongly to be inherited." Also, in view of the evidence they received of the frequency with which feebleminded women were admitted to the lying-in wards of the workhouses, to be delivered of illegitimate children, they are of the opinion that the prevention of mentally defective persons from becoming parents would tend largely to diminish the number of such persons in the population. They therefore advise that the mentally defective living at large and uncontrolled, both men and women, should be placed in institutions and kept under effectual supervision so long as may be necessary.

The Commission also recommends that the courts before which criminals who are also mentally defective are tried, should have power to have the mental condition of such persons inquired into, before or after their trial, and if necessary arrange for their detention in suitable institutions.

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MOLLUSCUM CONTAGIOSUM. *E. Graham Little, M.D., F.R.C.P.*

Knowles[1] records an epidemic in an institution for children, 59 cases of the disease having been noted out of 350 children. He gives a short summary of previous epidemics recorded in literature. Inoculation experiments have been repeatedly successful, and demonstrate the incubation period for the tumour to be "from a few weeks to many months." Their infectivity is established by these facts, but

the organism has not yet been isolated; it has been demonstrated, however, that the infective material will pass through a filter. (Juliusberg & Borrel, quoted by Darier, *Précis de Derm.* 1909, *p.* 633). The distribution of the disease seems to be curiously irregular; Pusey, of Chicago, in the subsequent discussion, declared he saw "ten cases of blastomycosis for one of molluscum contagiosum." Arthur Hall, of Sheffield, assured me the disease was seldom met with in that town. Children are much more commonly affected than adults; the lesions are usually few in number; in Knowles' 59 cases, the largest number present in any instance was 12; the eyelids were the site of disease in 22 of the 59 cases, the chin coming next (16) in frequency.

Stowers[2] reported an interesting case of very numerous lesions in an adult, and I have recently seen in a private case (a lady aged 54) an extensive eruption in which over sixty lesions could be counted, occurring chiefly on the chest and back. She had had Turkish Baths at frequent intervals for over two years, and one of the masseuses attending her was reported to be the wife of a breeder of pigeons which were kept as pets. No definite infection in these latter could be established, however.

The TREATMENT is to destroy the tumours, either by a sharp **Curette** or by **Incising** them, squeezing out their contents, and swabbing the evacuated cavity with tincture of **Iodine** or pure **Phenol.**

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MORPHINISM, CHRONIC. *Bedford Pierce, M.D., F.R.C.P. Norah Kemp, M.B., C.M.*

Professor Gamgee,[1] in a paper on "Chronic Morphinism and its Treatment," and Oscar Jennings,[2] of Paris, in a letter on the same subject, hold more or less similar views as to the causes and methods of treatment of this condition. The former finds more than one cause, and the latter states that several "factors" play their part in the etiology of the craving for morphia. They state that these causes or "factors" have nervous, circulatory, respiratory, digestive, and metabolic elements, and they group the symptoms and indications for treatment under three headings: (1) Nervous irritability; (2) Cardiac disturbance and failure; and (3) Stomach difficulty. Both consider the sudden withdrawal of morphia absolutely cruel and not unattended by danger, as instances have occurred of acute delirium and of acute mania following the abrupt withdrawal of the drug. The treatment should be carried on in a home or institution where the physician in charge is thoroughly acquainted with this class of case, and should extend over a period of from six to ten weeks. Gamgee recommends that the patient should be kept in bed, and the morphia be given by the mouth in decreasing doses, but Jennings suggests that this might be a cause of gastritis, and prefers to give it hypodermically, and to have the patient up and about. He treats them with: (1) **Turkish Baths,** or hot-air baths, followed by hot and

tepid douches; (2) Heart tonics, **Digitalis** and **Sparteine**; (3) For the stomach trouble—which in his cases was functional, a perversion of secretion, chiefly a hyperacidity—he prescribes bicarbonate of soda in the form of **Vichy Water.** Ordinary prolonged hot baths he finds depressing, especially to the heart, and liable to be followed by an increase of the craving. The Turkish and hot-air bath he finds sedative and tonic.

REFERENCES.—[1]*Lancet*, Sept. 12, 1908; [2]*Ibid.* Oct. 31, 1908.

MOUTH AND TONGUE, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

This subject was treated of in an exhaustive manner at the meeting of the International Society of Surgery, held in Brussels in September, 1908. There was difference of opinion as to the causation and the ultimate results. Collins Warren[1] read a paper, his conclusions being:—

1. The relation of the lymphatic system to the primary growth is the most important anatomical consideration in operations for cancer of the mouth and tongue.

2. Chronic inflammatory processes of the mucous membrane which do not yield promptly to local treatment are of importance as predisposing to cancerous conditions, and should be treated surgically.

3. Cancer of the mouth and tongue is a local disease limited to the lesions immediately surrounding its point of origin, and to the adjacent lymphatic system. Internal metastases are rare.

4. Microscopical examination of the primary growth should be made the crucial test of diagnosis in doubtful cases, and should be done preferably at the time of the operation. Antisyphilitic treatment is not a sure guide; it may lead to a temporary improvement, and should not cause delay in surgical interference.

5. The modern operative treatment of cancer of the mouth and tongue involves: (*a*) Preliminary treatment of the cavity of the mouth; (*b*) Protection of the respiratory tract by drugs and intubation of the pharynx, or laryngotomy, or by position; (*c*) Removal of the primary lesion with a margin of one inch, if possible, of healthy tissue; (*d*) Block dissection of the lymphatic-bearing tissues of the anterior cervical triangle, on one or both sides, as a routine measure; (*e*) A lower operative mortality may be obtained by performing the block dissection of the neck as a secondary operation about two weeks after the excision of the primary disease; (*f*) The intrabuccal operation is inadequate to reach the entire operation field, and should be supplemented by a dissection of one or both anterior cervical triangles; (*g*) The submaxillary route, although it permits a block dissection, does not give as free access to the diseased tissues as is demanded in an operation for cancer. (*h*) The route through the jaw exposes the whole field of operation, and enables the surgeon to act as if operating upon the surface of the body; but division of the lower jaw, as at present performed, adds greatly to the surgical risk.

6. The ideal operation of the future should contemplate a free exposure of the mouth and anterior cervical triangles as one continuous

area, with a block dissection of its diseased contents. The use of mechanical devices for the protection of the respiratory tract, and the perfection of the technical details of the operation along the lines already suggested, should enable us to perform an operation of this character without the large mortality which is now to be expected.

7. The mortality varies directly with the extent of the operation; it is lowest (5 per cent) with the intrabuccal operation, and highest (30 to 35 per cent) in the operations involving division or resection of the lower jaw. Death is as a rule attributable to shock, sepsis, or bronchopneumonia.

8. In a series of cases taken consecutively from the records of the Massachusetts General Hospital, 112 operations upon cancer of the tongue and mouth resulted in 16 cases free from recurrence over three years after operation (14·2 per cent).

9. Of 57 cases of cancer of the tongue, 10, or 17·5 per cent, were cured.

10. Local recurrence of the disease occurred more frequently than recurrence in the lymphatic glands alone. In only one case did recurrence appear more than three years after operation.

Collins Warren's paper reviews the various methods that have been adopted to prevent hæmorrhage and suction of blood into the trachea, and gives rates of recovery in various hospitals, etc.

H. L. Butlin[2] gives a résumé of the operations he has performed for removal of cancer of the tongue. These have been almost entirely through the mouth, and the lower jaw has never been divided, although portions of it have been removed in a number of cases. The object has been to remove the disease altogether, with if possible, three-quarters of an inch of surrounding healthy tissue. Since 1900 he has performed a preliminary laryngotomy in all the cases, between sixty and seventy in number. He highly recommends it, for it has all the advantages of a tracheotomy without the disadvantages. It only takes a minute to perform, it enables the operator to deal much more deliberately and effectively with the disease of the tongue, however extensive it may be, and it allows the anæsthetist to pursue his duties without interruption. There has been no selection of cases, and although most of the very bad cases have been failures, he has been astonished at the success which has attended resolute surgery in some of those in which the result seemed to be hopeless. The future of the operative surgery of carcinoma of the tongue undoubtedly lies in *early diagnosis* of the disease, and in the *routine removal of the glands* before they are obviously enlarged. Out of 197 cases, 55 are alive and well with from three to twenty-two years free from recurrence, and 20 died as a result of the operation (10 of these from septic pneumonia). In addition, 4 died of other disease than cancer of tongue and glands between one and three years after the last operation, and 6 are alive and well between one and three years after the last operation. The results of the second 99 cases are better than those of the first 98; among the 98 were 23 successful results; among the 99, 32. In the year 1895 Butlin began the routine removal

of the contents of the anterior triangle, and out of 114 cases since that time he has removed the contents of the anterior triangle in 70. The percentage of the successful cases out of 44 patients in whom the glands were not removed is 29·26 per cent. The percentage of successful cases out of the 70 where the glands were removed is 42·01 per cent, thus showing a great advantage in removing the glands. The mortality is less when the glands are not removed at a single sitting; in 22 cases where both glands and growth were removed at a single sitting, 4 died from the operation; in 48 cases where the operation was done in two sittings, there were 2 deaths due to the operation.

The evidence from Butlin's cases is largely in favour of removing the glands, whether enlarged or not, and of not deferring the operation until the glands are enlarged. He thinks that in most cases removal of the contents of the anterior triangle is sufficient as a routine procedure; but where the primary disease is seated far back on the border of the tongue, and in those cases in which the glands are badly affected in the parotid (upper carotid) region, the dissection should be carried into the posterior triangle, and should be taken well up to remove the glands in the parotid region, and for this purpose it is necessary to remove the lower part of the parotid salivary gland. The cases of which he has notes are not sufficient in number to decide whether the glands on both sides of the neck should be removed or not. Removal of the glands on both sides should be done in the following cases: where the glands on both sides of the neck are enlarged; where the glands are affected only on the side of the neck opposite to the disease. Where the disease is seated on both sides of the tongue, or in which it reaches to the middle line of the tongue; probably in those cases in which microscopical examination gives reason to believe that although the primary disease is apparently only of small extent and depth it is much more malignant than usual, when, for instance, columns of cancer cells are found running deeply down between the muscular fibres.

Cheatle has recommended that the hyoglossus, the geniohyoglossus, and the inferior lingualis muscle should be removed in every case of cancer of one half of the tongue, even if the primary disease is quite small and in an early stage of its existence. Butlin's cases do not support these researches, but he thinks it will be desirable to carry it into effect in the more advanced cases, especially in those in which the disease lies beneath the border of the tongue and passes into the floor of the mouth. The objections to it, in addition to the larger operation which it involves, are that the mobility of the tongue is seriously impaired, and in consequence speech and mastication are not nearly so good as in other cases. The evidence, in Butlin's opinion, is not strong enough in favour of removing the tissues between the primary disease and the glands to justify the extra risk involved. In order to carry it out methodically and completely, it would be necessary to remove the primary disease and the glands in one continuous mass,

and the large wound would in most cases suppurate badly. The anterior part of the dorsum is the least dangerous seat of cancer *quà* affection of glands, but it is not safe to rely on this. In cases of quite recent and small cancer of the tongue the glands should be removed.

From his experience, cancer originating in the floor of the mouth can be removed with a good prospect of success provided it is not very extensive and has not involved the bone. The results of operation for removal of recurrence of the disease are so bad that operators are advised to make the first operation as complete as possible in the belief that the only hope of the patient lies in the thorough manner in which this operation is performed.

Butlin[3] in a further paper, brings his cases up to 200. No further death resulted, and two more successful cases were added to the list. It may be roughly reckoned that 820 persons suffer from cancer of the tongue in England, and that 750 of them die of the disease either with or without operation: a result not very creditable to surgery. Yet Butlin thinks we in this country probably show as good results for our operations as the surgery of any other country, if not better. The feeling on the Continent and in America is absolutely pessimistic regarding cancer of the tongue.

As regards early cancer of the tongue, the conditions may be divided into five classes: (1) A little plaque like a hard sore, smooth and polished, but neither ulcerated nor excoriated. (2) The transformation or replacement of a simple ulcer by a cancerous ulcer which only differs from the simple ulcer by feeling a very little stiffer and a very little firmer. (3) The transformation of an entire plaque of leucoplakia into a plaque of cancer. The difference is marked by very slight thickening, a denser white, and furrowing or fissuring in various directions, but without excoriation or ulceration. (4) The transformation of one small area of leucoplakic tongue into cancer, only marked at first by very slight and superficial hardening. (5) A white warty growth or compound wart neither broken or ulcerated, and feeling at first as if it were fixed to the mucous membrane and quite superficial.

There are other ways in which cancer of the tongue begins, but these seem to be the most frequent and the most typical. In one early case the actual cancer only measured about $\frac{1}{8}$ in. across by $\frac{1}{24}$ in. in thickness; there was never any local recurrence, and the defect in the tongue was so trivial that it was not noticed by his medical attendant who examined his mouth more than three years later to discover the source of infection of enlarged gland from which he was then suffering; yet this patient died of epithelioma of his glands due to that cancer. Radium may remove small epitheliomata of the tongue, but removal of the primary disease is only part of the cure of epithelioma, and the most insignificant epithelioma of the tongue is capable of affecting the lymphatic glands.

Childe[4] lays down the following principles in removal of the cancer of the mouth and tongue: Wide local removal; wide glandular

dissection in all cases; the desirability of performing this operation, as all operations, at one sitting if possible; the desirability of avoiding a communication between a wound in the mouth which is necessarily septic and a large wound in the neck which otherwise there is no difficulty in keeping aseptic; the desirability of not introducing any unnecessary procedures into an operation which is of itself complicated enough. He says that in every case of intra-oral cancer the neck should be attacked first, one or both linguals and facials tied, and the primary growth in the mouth should be removed subsequently, either at the same or a future sitting. He thinks that ligature of the facial and lingual arteries is the key to the operation for intra-oral cancer. He has ligatured these arteries on thirty-nine occasions, with the following advantages: The excision of the tongue is practically a bloodless operation; as the hæmorrhage is eliminated, the removal of the tongue is a much simpler operation, and enables the surgeon to perform it at one sitting, as the glandular dissection is done first and the arteries are tied at the same time, and to complete the operation the surgeon has only to remove the tongue with no hæmorrhage. The surgeon is also enabled to excise the growth in the mouth with greater decision and deliberation; he can see what he is doing and where he is cutting. In many cases of extensive disease it is prudent to divide the operation into two sittings. The blood supply to the growth is cut off. Ligature of the lingual and facial arteries may starve any cancer cells in the neighbourhood which have been left behind after the completion of the operation. There is no necessity for preliminary laryngotomy or tracheotomy. A communication between the mouth and a large wound in the neck should be avoided if possible, by doing the neck operation first, with ligature of the lingual and facial arteries, and the mouth operation a fortnight later. Should the disease be situated in the tonsil or its neighbourhood, the communication cannot be avoided. Early diagnosis is the only hope, and iodide of potassium should be relegated to the limbo of dangerous playthings. Immediate microscopic examination of a piece of the growth should be the only test; if this is doubtful, push the iodide rapidly and don't watch its effects too long.

References.—[1]*Ann. Surg.* Oct. 1908; [2]*Brit. Med. Jour.* Jan. 2, 1909; [3]*Ibid.* Feb. 20, 1909; [4]*Ibid.* Jan. 2, 1909.

MUMPS. *E. W. Goodall, M.D.*

Pathology.—J. Gordon Sharp[1] gives an account of a number of cases which came under his care during an epidemic in Leeds which lasted from September, 1907, to May, 1908. The ages were from seventeen months to forty-one years, though all the patients except three, were children. As a rule, even during the acute stage, the pulse was slow and the temperature seldom higher than from 101° to 102·5° F. So far as could be ascertained, the incubation period was ten to fourteen days. The most prominent symptom of mumps is the inflammation of one or both parotid glands. It is known that one of the complica-

tions or sequelæ of mumps, orchitis, may in some cases be the only local manifestation of the disease, the parotid gland being unaffected. According to some writers, too, the local affection may be limited to inflammation of the cervical lymph-glands. Sharp gives instances in which symptoms which pointed to inflammation of the pancreas were the only signs of mumps. Thus on Feb. 3rd, 1908, Sharp saw a girl, aged 13, suffering from an ordinary attack of mumps. The disease ran its usual course without any after-effects. On Feb. 13th he was called to see the patient's brother, aged 11, who had been seized suddenly with intense pain (without vomiting) in the left hypochondrium and in the epigastrium. Shortly afterwards he passed by the bowel about 5 oz. of dark blood containing large droplets of fat. Later in the day, and also the next day, he passed blood and fat. The acute symptoms quickly passed off, and the boy made a good recovery without any parotitis. The microscopical examination of the fæces in this case showed fat, blood, and undigested muscle fibres and connective tissue. No free bile pigment was to be found. The urine reduced Fehling's solution. Of the severe abdominal symptoms occasionally observed in mumps, Sharp writes: "The abdominal symptoms in mumps are often very alarming. There may be sickness and vomiting, and blood may be vomited. The pain is often severe, and this may be accompanied by collapse. The abdomen may be tense, and tender to the touch. Sometimes a swelling is to be felt. The tenderness, swelling, tumour, or severe pain is limited to the left hypochondrium and to the epigastrium. This is a peculiarity of the affection, and helps one in distinguishing it from other abdominal affections. I need hardly say these signs and symptoms point to an extension of the disease to the pancreas. Now and then there is passage of large quantities of blood and fat droplets by the bowel, while at other times constipation is a prominent symptom." These alarming symptoms usually disappear very rapidly, so that a favourable prognosis can be given.

The writer further states that he has "often seen one or more children of a household suffer from typical mumps, while one or more children of the same household had general malaise without any evidence of swelling of the parts generally affected in mumps." He believes that the latter had mumps but without the usual outward manifestations thereof.

Bearing on the lateness at which sequelæ may develop and the patient be presumably infectious, Sharp states that he observed a case in which a boy developed orchitis six weeks after the parotitis, and another in which a girl suffered from vulvitis eight weeks after the parotitis. One patient, a girl, aged 10, had mumps, with parotitis followed by vulvitis and pancreatitis. In another patient, a girl, aged 5, the disease began with symptoms of pancreatitis; forty-eight hours later parotitis set in. In a woman, aged 41, the initial symptoms were severe pain over the vertex of the head, sleeplessness, stiffness of the muscles of the head and especially of the neck, photophobia,

and great irritability of the whole muscular system. On the fifth day the left parotid gland was found to be swollen, and on the sixth the right.

In an outbreak of mumps which occurred in the family of an Indian gentleman residing at Contai (fifty to sixty miles from Calcutta), Jadub Kristo Sen[2] met with three unusual cases. In the first case, that of a Hindu youth 16 years of age, a moderately severe attack of mumps was followed in a week by chills, dull, aching pains in the back and limbs, pyrexia (104·6° F.), swelling of the tonsils and pharynx, and at night drowsiness and delirium. A day or two later there were ill-defined pains in the epigastrium, with vomiting and a feeling of constriction in the upper part of the abdomen. Deep pressure elicited pain and tenderness over the pancreas and duodenum. This lasted for three days. The day after this tenderness had disappeared, the right testicle became swollen, and four days later the left. In the second case, a Hindu boy of 9, four days after a slight attack of mumps, when the patient was apparently convalescent, there was swelling of the submaxillary and sublingual glands, with vomiting, "ague-like fits," and pyrexia. At midnight the temperature ran up to 104° F. and the patient began to suffer from twitchings of the muscles of the face and extremities, and became delirious. These disappeared next day, but during the following night "the child was troubled with a severe pain in the head (of a neuralgic nature), the intensity of which made him roll in bed and shriek with agony. In spite of all treatment the pain continued without abatement till the next morning, when relief followed a free flow of saliva, which continued with profuseness for nearly twenty-four hours. In the third case, a Hindu woman aged 18 years, the attack supervened two weeks after confinement. The patient was troubled for about a week with "pain and swelling of the labia, which disappeared as soon as a free discharge from the parts was established; sanious lochial discharge continued to flow for more than six weeks." The three patients all made good recoveries. In mumps, severe, even alarming symptoms, by no means necessarily call for a grave prognosis.

Treatment.—In the epidemic at Leeds, Sharp found that 5-gr. doses each of the **Salicylate** and **Bicarbonate of Sodium,** well diluted with aerated soda-water, very efficacious in relieving the pain in the muscles of the neck, and in thus procuring sleep. For abdominal pain he recommends 3 min. of tincture of **Opium** diluted to half a fluid drachm with glycerin and water, every hour, or even more often when necessary. In these cases the volume of fluid should be reduced as much as possible, because anything which distends the stomach, even slightly, increases the pain.

References—[1]*Lancet*, Jan. 16, 1909; [2]*Ind. Med. Gaz.* Mar. 1909.

MUSCLE, WASTING OF. *Purves Stewart, M.D., F.R.C.P.*

For a number of years massage and passive movements have been employed empirically in the treatment of muscular wasting, and with considerable success. The principles upon which massotherapy are

based are, however, still imperfectly understood, even by many practitioners of the art. Rochard and De Champtassin[1] have recently devoted considerable study to these principles. They point out that a muscle, in accordance with the laws of evolution of all ordinary tissues, can attain, of itself, a considerable degree of development, varying according to race, family heredity, etc. To this first step of normal development there may be superadded a second or "hypertrophic" stage, wherein the force and volume of the muscle are considerably augmented by the increase in the diameters of the existing fibres, not by formation of new ones. Such physiological hypertrophy, attained by exercise, does not go on indefinitely, but is limited by the individual's original stock of muscle-fibres which are capable of development, his so-called "muscular coefficient." This is readily understood when we remember that the muscle-fibres are laid down in a definite number during early fœtal life. The growth in size of a muscle, then, is due to an enlargement of its primitive fibres.

Muscular hypertrophy is produced by bringing into play its voluntary contraction, i.e., by doing work, preferably by systematic athletic exercises, which consist essentially in exertion against resistance. It is a common belief that flushing a muscle with blood necessarily causes it to develop. On this theory are based most of the systems of exercise by means of light weights, which consist, essentially, in performing a large number of movements against slight resistance. The immediate result, it is true, is a congestion and temporary increase in the size of the muscle, which, however, Rochard and De Champtassin allege, pass off with the hyperæmia, but without permanent increase of muscular force. Such methods produce a better utilization of the already-existing muscular force, but they do not cause a true hypertrophy. To produce such true hypertrophy, the muscles must be exercised against a resistance which is progressively increased. This resistance cannot be increased indefinitely, but only up to the point when it produces the maximum hypertrophy of which the particular individual is capable. Such hypertrophy, once attained, being something superadded to the normal, is not permanent; to maintain it, the muscle must be kept exercised by the same means as those by which the hypertrophy was achieved, i.e., by systematic exercises.

How are these principles to be applied to wasted muscles? Hitherto, the treatment has ordinarily been by baths, massage, and electrotherapeutics, of which massage is the most useful. Massage produces its good effects mainly by compression of the tissues, promoting absorption of exudates, and inducing a temporary vasodilatation. But for the development of a wasted muscle, e.g., after an acute arthritis, Rochard and De Champtassin contend that something more is necessary, viz., active muscular contraction against resistance. In this respect, electrical stimulation has a certain field of action, but it is inferior to voluntary contraction by the patient. In the treatment of muscular wasting, then, the best procedure is to make the patient voluntarily contract the weak muscle, interposing as resistance a weight which is

PLATE XL

HAIRY PIGMENTED MOLE

Photo. by Dr. W. Kenneth Wills

progressively increased at each succeeding séance. So-called Swedish movements include a certain number of movements against resistances ; but the important factor to recognize is the progressive increase to be made in this resistance. This fact has been known empirically for centuries, since the time of the Grecian athlete, Milo of Crotona, who commenced by lifting a new-born calf, and who, by repeating his exercises with the same animal daily, is said to have succeeded in raising on his shoulders the four-year-old ox.

To take a concrete example of this method, Rochard and De Champtassin instance cases of acute arthritis of the knee-joint, whether consecutive to injury or to gonococcal arthritis. First of all, to allow of movement of the joint, it is necessary to remove the inflammatory effusion within it. For this purpose, they perform aspiration with a needle. Next day, active exercises of the quadriceps are begun. This active contraction favours the absorption of any inflammatory effusion which may still remain. Day by day the exercises of the knee are increased, a progressively increasing weight being pushed out by the leg, both in the sitting and the recumbent posture. In this way, with daily séances, by the end of a fortnight the muscle of the affected knee is usually equal in power to that of the opposite side. They quote instances where the fluid obtained by aspiration contained numerous gonococci, but where, nevertheless, a perfect result was obtained. Osteo-arthritic cases where there are osteophytes, and cases where the synovial membrane is deficient in fluid, are unsuitable for this method.

REFERENCE.—[1]*Rev. de Chir.* Jan. 10, 1909.

MYOPIA. (*See* REFRACTION.)

NÆVUS. *E. Graham Little, M.D., F.R.C.P.*

A very successful removal by repeated **Operation,** with subsequent **Thiersch Grafts,** is reported by Curry.[1] The nævus (a hairy pigmented mole) occupied the right half of the face in a young girl, and invaded the hairy scalp. All the tissue was removed by excision, with the exception of that portion directly in contact with the eye, which was treated by electrolysis. The Thiersch grafts all "took" They were dressed with gauze held in place by small strips of adhesive plaster with guttapercha tissue outside this ; the gauze was removed after forty-eight hours, and it was found to be an improvement on the usual rubber covering. The cosmetic effect, as revealed by the photographs, is strikingly good.

Dr. Kenneth Wills kindly supplies me with a stereoscopic photograph of a hairy pigmented mole on the back of a small boy. There were many satellite moles scattered about without obvious arrangement. As is usual, there was a supposed maternal pre-natal impression of a goat, the hairy coat of which the mole closely resembled (*Plate XL*).

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Mar. 27, 1909.

NASAL ACCESSORY SINUSES, DISEASES OF. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

Frontal Sinus.—In order to obliterate the frontal sinus, while at the same time avoiding supra-orbital deformity and a nasal scar, A. E. Prince[1] adopts the following technique: (1) Intranasal preparation, consisting of the introduction of a post-nasal plug, the correction of any existing septal deformity, and the removal of the anterior end of the middle turbinal. (2) After shaving and sterilizing the eyebrow, an incision is made along its middle from a point opposite the junction of the fronto-nasal and maxillary bones. The incision is purposely not carried down along the side of the nose. (3) An incision is then made through the periosteum corresponding with the skin incision, but extending a little further under the skin towards the nasal angle. The periosteum is then separated from the roof and inner wall of the orbit, carrying the trochlea with it. (4) The sinus

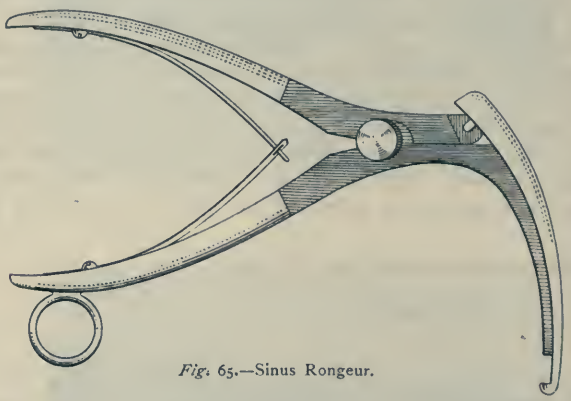


Fig. 65.—Sinus Rongeur.

floor is then removed. By means of a retractor, the orbital contents are separated from the inner wall, and the naso-frontal angle of the orbit exposed. An opening is now made with a rounded chisel, and is enlarged according to requirement by means of a special rongeur (*Fig.* 65). The os planum is removed as far backwards as the anterior ethmoidal foramen. Access is in this way also obtained to the posterior ethmoidal cells and to the sphenoidal sinus. The remainder of the floor of the sinus is removed by means of forward or lateral biting forceps. (5) The whole mucosa lining the frontal sinus is now carefully curetted, and all doubtful points cauterized with pure phenol. (6) The cut edges of the periosteum are united with pyoktannin catgut, and horsehair sutures are used to bring the edges of the skin together.

Antrum.—In an important and scientifically worked-out paper on "The methods of dealing with suppuration in the maxillary sinus," A. Logan Turner[2] summarizes his views upon the co-existing presence of nasal polypi as follows: (1) In uncomplicated cases of antral suppuration, nasal polypi were the exception and not the rule

in 14 per cent of a series of 180 cases. (2) They were not found in any of the cases in which the discharge had existed for less than a year. (3) They occurred in 18 cases in which the discharge had existed from one to eight years. (4) Of 15 cases of nasal polypi treated by lavage, 14 were cured, 4 were not cured, and 1 was lost sight of. (5) The presence of nasal polypi in antral suppuration should not at once determine the surgeon to perform the radical operation upon that cavity. (6) The existence of nasal polypi in antral suppuration is much more suggestive of the co-existence of suppuration in one of the other sinuses, for example, ethmoidal or frontal cells.

His general conclusions upon the question of treatment are :— (1) The success or failure of lavage is not influenced by the age of the patient. In patients of advanced years, however, the minor operation of lavage is to be preferred, because of its simpler nature, associated with the minimum of shock. (2) The existence of nasal polypi with antral suppuration should not make the radical operation imperative, as cases associated with nasal polypi cure by simple irrigation. Nasal polypi, however, should raise the suspicion that the antral disease is complicated with suppuration in one of the other sinuses, probably in the ethmoidal cells. (3) In cases of recent antral suppuration (duration under one year) lavage may be successfully practised in the majority of cases. We have not sufficient cytological and bacteriological data at present to allow us to determine before treatment is commenced, in what cases of this class lavage may prove a failure. (4) In cases of long-standing suppuration (duration one year or more) lavage may in the first instance be practised when the pneumococcus and staphylococcus are the predominant organisms. When in the same class of case the *Streptococcus pyogenes* is the virulent organism, or when the streptococcus is associated with the presence of squamous epithelium and lymphocytes, the radical operation should be advised. (5) When lavage is decided upon, an intranasal operation should be carried out in preference to the alveolar route. When the radical operation is practised, the only satisfactory method is through a large opening in the wall of the canine fossa. After curetting what is necessary, the operation should be completed by making an opening through the antronasal wall and allowing the buccal wound to close (Caldwell-Luc.)

Roe, of Rochester,[3] in a discussion upon the methods of opening the maxillary antrum, strongly advocated the intranasal route. His *modus operandi* consisted in first removing the greater portion of the inferior turbinal with knife or scissors. An incision was then made through the periosteum from behind forward, along the whole length of the antral cavity, the periosteum raised from the underlying bone being lowered into the nasal cavity, so as to be temporarily out of the way. A large opening was then made through the nasal wall of the antrum, and the interior inspected and dealt with as desired. The periosteal flap was then replaced, rolled out upon the floor of the antrum, and held in position by a strip of dry gauze. Subsequent irrigation of the cavity could easily be accomplished by the patient.

J. Donelan[4] also recommends the nasal route, and has designed for the purpose a special right and left rectangular chisel (*Fig.* 66). The chisel has a stout handle and shaft with a double-edged blade wrought in the same piece and at right angles. Along the "obverse" side the blade has a strong ridge slightly hollowed in the middle to facilitate retention in the cut. The "reverse" side is flat and placed at an angle of 50° to the shaft. To make the initial puncture, an angular V-shaped gouge (*Fig.* 67) with curved cutting edges is used.

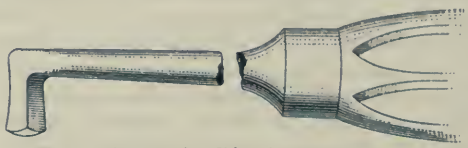


Fig. 66.—Rectangular Chisel for maxillary antrum.

The operation may be performed under local anæsthesia, but a general anæsthetic is preferable. In dealing with the inferior turbinal, the author removes its middle third or posterior half, on account of its intimate relation with the widest part of the antral cavity.

The exact method of procedure is described by the author as follows: The patient should be anæsthetized in the reclining position, with the head slightly raised and turned to the right, where the surgeon stands for either cavity. It is better to plug the nasopharynx with

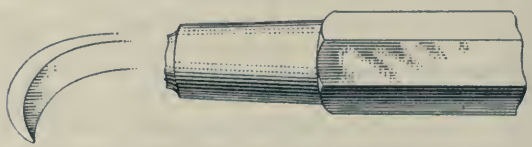


Fig. 67.—Curved Gouge for antral wall (part of shaft omitted).

a captive sponge. Taking, for example, the right antrum, the angular trocar should be applied at a point not less than an inch and a quarter behind the posterior border of the nostril immediately below the inferior turbinal in such a way that the lower limb of the < is nearly parallel with the floor of the nose, while the upper edge raises and cuts through the turbinal. The puncture is made slowly, and so that while the point travels towards the deeper part of the cavity, a slight swing of the handle towards the middle line obtains the full advantage of the curved cutting edges. It will sometimes, though rarely, be found needful to shift the point a little higher or farther back, but never forwards. The < puncture having been made, the chisel corresponding to the figure should be held with its "obverse" surface upwards, slipped into the upper limb of the <, and carried backwards and somewhat upwards as far as may be thought necessary, generally from half to three-quarters of an inch. It should then be drawn back, slipped into the lower limb of the <, and pushed back, cutting with

its distal edge along the floor for a similar distance, but taking at the end a turn upwards towards the termination of the first incision. Then the companion instrument (reverse of figure) should be slipped along the upper cut with its " obverse " surface downwards, and a short cut, down and back, made to complete the excision. A slight twist of the handle at the end will send the fragment into the meatus, whence it can be removed with forceps. The whole excision takes only a few seconds from the initial puncture. The cavity should then be explored with the little finger or, where this is not possible, with a large probe suitably bent. Farther portions of the wall may then be pared away if desired, the proximal edge of the blade finding its chief use here, and it is often advisable to remove what remains of the posterior end of the turbinal. This may be done with either chisel used as a spoke-shave. At this stage, suprarenal products and a small aural mirror with a good head-light will often be found useful in examining cases of long standing which are inaccessible to the finger. Even if the mucous membrane is much degenerated, no curetting should be attempted, as in the majority of cases it gradually becomes healthy. If, however, there are distinct polypi, and especially if a similar condition has co-existed in the middle meatus, it will probably be better to proceed with the radical operation. In either case the cavity should next be injected with a 10-volume solution of hydrogen peroxide, or washed out with sterilized water or saline solution. After operation it is better to use no packing. Hæmorrhage is rarely troublesome.

Suppurative Ethmoiditis.—In discussing the treatment of acute suppurative ethmoiditis, F. Krauss[5] tabulates his conclusions as follows : (1) Acute suppurative ethmoiditis causing orbital and cerebral symptoms is not so rare a condition as has been thought. (2) It is often rapidly fatal, especially in the young. (3) Indications for operation in acute ethmoiditis are, sudden increase in temperature, delirium at night, tumour formation in the inner wall of the orbit, and the slightest exophthalmos. (4) When there is bilateral exophthalmos, operation is usually useless, as the disease has probably extended through the cavernous and circular sinuses, causing a general pyæmia and toxæmia, or fatal brain lesion.

The Orbital Complications of Suppuration in the Frontal and Ethmoidal Air Sinuses.—H. Logan Turner[6] discusses the importance of recognizing the nose and its accessory cavities as factors in the production of orbital and ocular phenomena. Of 9 cases, 6 were females and 3 males. In 6 of the cases the onset of the symptoms was acute ; in the other 3 the process was chronic. The acute cases occurred in young subjects, 5 being under twenty years of age and 1 under thirty. The chronic cases occurred in older patients. The author is in favour of the early performance of an external operation in both acute and chronic cases.

REFERENCES.—[1]*N.Y. Med. Jour.* May 8, 1909 ; [2]*Brit. Med. Jour.* Oct. 10, 1908 ; [3]*Jour. of Laryngol.* Oct. 1908 ; [4]*Lancet*, June 19, 1909 ; [5]*N.Y. Med. Jour.* Apr. 24, 1909 ; [6]*Edin. Med. Jour.* May, 1909.

NASAL SEPTUM.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

C. W. Richardson,[1] in discussing the relative value of the various methods of dealing with deflected nasal septa, sums up as follows: "The old method is rarely attended with perforation. I have had only two in my whole experience. Theoretically the submucous method should be attended with like results; practically perforations do occur. After performing 190 operations by the submucous method, and nearly twice as many by the older method, I have become firmly convinced that the submucous method offers the greatest advantages to the patient afflicted with a deflected septum in the hands of an operator thoroughly skilled in its technique. I know of no operation wherein unskilled and inexperienced hands can do more harm than by this operation. I feel as though I am becoming a strong advocate of the submucous operation, because it gives less discomfort to the patient, it taxes the skill of the operator, and when satisfactorily done gives excellent results."

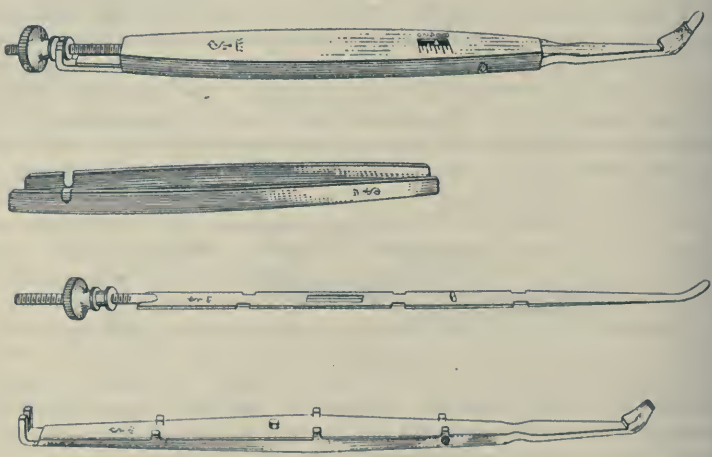


Fig. 68.—Avery's Septatome.

The Avery Nasal Septatome.—In order accurately and at the same time rapidly to incise the mucoperichondrium, and later the cartilage, in submucous resections of the nasal septum, the septatome devised by Avery (*Fig.* 68) will be found useful.[2] The head of the instrument, set at an angle of 45° from the handle, prevents the operator's hand from obscuring the field of operation, and permits of great delicacy of touch. The blade is adjustable to cut a depth varying from $\frac{1}{32}$ to $\frac{6}{32}$ in. By means of a screw at the end of the blade, any desired change is quickly and accurately made, while an indicator upon the handle registers the length of the exposed portion of the blade, and hence the depth of the incision.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* Feb. 1909; [2]*Med. Rec.* Feb. 6, 1909.

NEPHRITIS. (*See also* URINE). *Francis D. Boyd, M.D.*

The Operative Treatment of Chronic Nephritis.—In 1901 the late Dr. Edebohls suggested the treatment of chronic Bright's disease by **Decapsulation** of the kidneys. The suggestion was based on the theory that by removal of the impervious capsule an opportunity was created for the formation of new vascular connections between the blood-vessels supplying the secreting structures of the kidney on the one hand and the blood-vessels and tissues surrounding the kidney on the other. An additional blood-supply was thus created which led to an improved working capacity and restoration of the health of the kidney. It was found that decapsulation of the kidney was always followed by the formation of a new capsule, more vascular than the original. The immediate effect of decapsulation is a marked increase in the secretion of urea, which may in some cases rise from an average of 6 grams or less, prior to operation, to 30 or 35 grams within a month after operation. The author[1] advises decapsulation for every sufferer from chronic Bright's disease who has a reasonable expectation of not less than a month of life without operation. Cardiac hypertrophy need not be a contraindication—in some cases pronounced cardio-vascular changes, present at the time of operation, have been found some years after operation to have become insignificant or to have entirely disappeared. Retinitis albuminurica when pronounced is regarded as a contraindication for operation, as experience proves that an unfavourable outcome may be expected in such cases. The author's experience of re-decapsulation has been that a second operation is not very encouraging.

The author gives his experience of decapsulation in 102 cases; of these 99 were kept under observation to the time of their death or to the date of publication:—

VARIETY OF NEPHRITIS AS ESTABLISHED AT OPERATION.

Right and left chronic interstitial	31
Left chronic interstitial, right kidney normal	4
Right chronic interstitial, left kidney normal	1
Right and left chronic diffuse	34
Left chronic diffuse, right kidney normal	3
Right chronic interstitial, left chronic diffuse	6
Right and left chronic parenchymatous	16
Right chronic diffuse, left kidney not operated on	1
Right chronic interstitial, left kidney not operated on ..	6

The only difficulty in the classification of the variety of nephritis that presented itself was in the cases of three patients whose kidneys were decapsulated for the cure of puerperal convulsions. In these three cases a subacute parenchymatous nephritis was encountered. As there was evidence, however, both from the condition of the kidneys, and in one case from the history of the patient, that the subacute nephritis encountered at operation was but an exacerbation of a previously existing chronic nephritis, these cases have been classified under the head of chronic parenchymatous nephritis.

From the above classification it will be seen that one variety of nephritis may affect one kidney, and a second variety the other kidney of the same individual—right chronic interstitial and left chronic diffuse nephritis having been observed no less than six times.

Of the 102 patients, 10 died within two weeks of operation, 39 died at periods more or less remote from operation, 3 disappeared from observation after leaving hospital, and 50 were known to be living at the time of publication. The operative mortality was 9·8 per cent. Of the 39 patients who died at periods more or less remote from operation, 10 died from causes that stood in no direct relation to chronic nephritis; 29 deaths may be fairly ascribed to chronic nephritis and its sequelæ or complications. Of the 53 survivors the results are given: Final result unknown, 3; unimproved or but little improved, 6; improved, 11; cured, 33. Cases were considered cured when the urine had remained free from albumin and casts, and the daily urea output normal or approximately so, for a period of at least six months following the verification of the disappearance of albumin and casts, and the patient free from the symptoms of chronic Bright's disease from which he or she formerly suffered. The author considers that the 33 cases alone would justify the operation, even if no benefit had accrued to the remainder of the patients. Benefit did, however, accrue to a considerable number, for of the total cases operated on 81 experienced amelioration. In judging the results it must be remembered that the immense majority of the patients came for operation only after all other measures and treatment had failed to arrest the progress of the disease. The author claims that for the present, in view of the helplessness of medicine in the presence of established chronic Bright's disease, the advance in treatment represented by renal decapsulation should be welcomed by every physician, nor is the physician justified in taking the position that only after other measures have failed will he resort to decapsulation. That is giving neither the operation nor the patient a fair chance. The operation is shown by experience to be almost free from danger in the early stages of chronic nephritis in the absence of complications, and is claimed to be an almost certain cure.

Croom[2] records an extreme case of puerperal eclampsia where decapsulation was undertaken as a last resort when death seemed inevitable. The operation was followed by a copious diuresis and eventual recovery. In considering the indications for operation in eclampsia, he concludes that clearly operation should not be thought of in cases before labour sets in or where it is in progress, because, however opinions may be divided with regard to obstetric interference in eclampsia, it is beyond doubt that in most cases the fits cease after labour is completed. The operation is therefore essentially an operation post partum, and the eclamptic should have the benefit of all recognized methods of treatment before resorting to operation.

Buist[3] records three cases of a similar nature, two of which recovered.

Salt-free Diet.—Widal,[4] in discussing the dietetic treatment of

nephritis, points out that though milk is relatively poor in salt content, still the amount of milk necessary to keep up nutrition in nephritis necessitates the exhibition of too much water, too much sodium chloride, and possibly too much protein. The impermeability of the kidney to sodium chloride is relative, not absolute. If an amount of salt beyond the capacity of the kidney for excretion be given in the diet, the sodium chloride collects in the tissues, carries with it water, and œdema results. On a purely milk diet the chloride intake can be reduced to about 75 gr. in the twenty-four hours, while a selected salt-free diet need not contain more than 15 gr. The removal of sodium chloride from the diet in nephritis with œdema is frequently followed by a copious diuresis, the diuresis persisting till all œdema has disappeared and the patient's weight becomes normal.

It must be remembered, however, that to administer a salt-free diet is merely to treat the chloride retention and œdema, and does not affect the complications due to the retention of the products of nitrogenous metabolism.

A salt-free diet which has been found useful in subacute or chronic nephritis with œdema is as under: *All articles to be cooked without salt. No salt to be used at table. Fluid to be limited in quantity.*

Breakfast.—Porridge and cream, salt-free bread, fresh butter, cup of tea. Fruit.

Dinner.—Fresh fish or chicken, potatoes, fresh butter, water-arrowroot, stewed fruit, cream, salt-free bread or biscuits. cream cheese.

Tea.—Cup of tea, salt-free bread and butter.

Supper.—Boiled bread and milk or rice and milk.

The above diet should not contain more than 30 gr. of common salt.

References.—[1]*Jour. Amer. Med. Assoc.* Jan. 1909; [2]*Edin. Med. Jour.* May, 1909, p. 443; [3]*Ibid.* p. 452; [4]*Sem. Méd.* Apr. 21, 1909.

NYSTAGMUS, LABYRINTHINE.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

During the past few years a considerable amount of work has been done, more particularly by Bárány, of Vienna, on the functions of the auditory labyrinth. The most important clinical outcome of his labours has been the discovery that under certain conditions the labyrinthine reflex of nystagmus is provoked. Briefly considered, the bony labyrinth consists of the cochlea, the vestibule, and the semicircular canals, containing respectively the end-organ of hearing, the saccule and utricle, and the membranous semicircular canals. There are three semicircular canals, each occupying a plane at right angles to the other two; they are named the anterior vertical, the posterior vertical, and the external horizontal. The two vertical canals make an angle of 90° with one another, and each makes an angle of 45° with the mesial plane, so that the anterior vertical canal of one side is parallel with the posterior vertical canal of the opposite side. Each canal has a dilatation at one end called the ampulla;

the ampullæ of the anterior vertical and horizontal canals lie close together just above the knee of the facial nerve and oval window; the ampulla of the posterior vertical canal lies deeply, and close to the jugular bulb.

According to Bárány, the following is a simple method of showing the relative position of the canals when the head is held erect: With arms against the side of the body, and elbows bent at right angles, bring the hands with the palms upwards, so that the middle fingers touch in the middle line in front, enclosing an angle of 90°. Now keeping the right hand in position, bend the fingers of the left hand at right angles to its palm, and place it upon the right hand, so that the ulnar borders of the palms lie together, and the little finger of the left hand lies across the joints of the right.

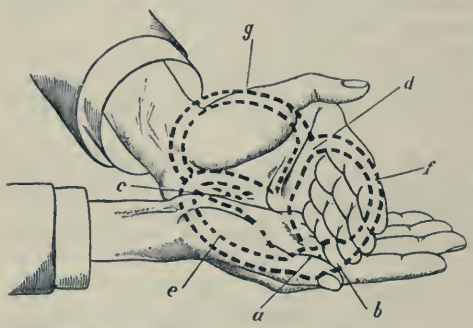


Fig. 69.—Mnemonic diagram of the canalicular system of the right side. (*a*) The ampulla of the horizontal semicircular canal; (*b*) The ampulla of the anterior vertical (superior) canal; (*c*) The ampulla of the posterior vertical (posterior) canal; (*d*) The confluence of the two vertical canals; (*e*) The convexity of the horizontal; (*f*) The convexity of the anterior vertical; and (*g*) The convexity of the posterior vertical canals.

The palm of the right hand will now represent the plane of the external horizontal canal, the fingers of the left hand the plane of the anterior vertical, and the palm of the left hand that of the posterior vertical canal, all of the right side, as will be seen from the diagram (*Fig.* 69). The bony canals contain the membranous semicircular canals, with their ampullæ; the lumen of the latter is about equal to a pin's head; that of the canal about the cross-section of a pin.

The membranous canals contain a thin fluid, endolymph, and communicate with the utricle, which is connected by a fine canal with the saccule; the utricle and saccule being contained within the bony vestibule; the saccule communicates with the membranous canal of the cochlea. In each ampulla lies the crista ampullaris, with its fine hair-cells and capula, from which stimuli pass *via* the vestibular ganglion, vestibular nerve, and its nucleus in the medulla, to Deiters' nucleus. From Deiters' nucleus fibres pass to the nuclei of the motor nerves of the ocular muscles of both sides, and to the motor neurons in the anterior horns of the spinal cord on both sides.

As long ago as 1892, Ewald showed by experiments on pigeons that a movement of the endolymph from the convexity of the right horizontal canal to its ampulla gave rise to a slow horizontal movement of the head and eyes to the left, followed by a quick return to the right: that is to say, it produced a nystagmus to the right; conversely, a movement of endolymph from ampulla to convexity set up a slow

movement of the eyes to the right, with a quick return to the left, i.e., nystagmus to the left.

Nystagmus is of two kinds : in one a quick undulating movement of the eye occurs, both movements taking place equally quickly (such a nystagmus is found in cases of insular sclerosis and other nervous diseases) ; in the second type there are two very definite movements : (1) a slow deviation of the eye in one direction, followed by (2) a rapid return to its original position. This latter type is known as vestibular nystagmus, and is the one with which we are concerned. It is described as being to the left or to the right, according to the direction of its second or rapid phase ; it is found also that if the eyes are turned in the direction of the rapid phase, the ocular movements will be intensified ; if in the opposite direction, such movements will be much diminished or will cease entirely.

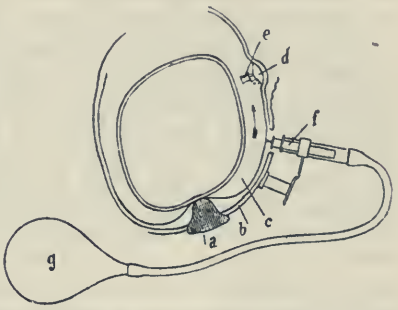


Fig. 70.—Diagram of Ewald's experiment (Bárány). (*a*) Plug in s.c. canal ; (*b*) Bony canal ; (*c*) Endolymph in membranous canal ; (*d*) Crista and (*e*) Cupula ampularis ; (*f*) Piston ; (*g*) Compressible air-bag.

We are able to produce vestibular nystagmus by (1) rotating the patient, (2) by syringing the auditory meatus with hot or cold water, (3) by electrical or direct mechanical stimulation of the labyrinth. The rotation reaction is produced by placing the patient on a revolving chair and turning it ten times to the right (for example), i.e., in the direction of the hands of a clock. On stopping the chair, it is found that the patient has horizontal nystagmus to the left, the duration of which should be noted by means of a stop-watch ; the average time is usually about forty seconds in the normal subject. It must be clearly understood that as a clinical test we observe only the nystagmus after the rotation is finished, but at the beginning of rotation a nystagmus is also produced in the opposite direction, as has been observed by the investigator being on the rotating platform with the patient. The following is the explanation of the phenomenon : When the head is in the erect posture, rotation will affect only the horizontal canals. Now, at the beginning of rotation the endolymph will tend to lag behind (just as one stumbles backwards in a tramcar if the latter suddenly starts forwards), and there will be relatively a flow of endolymph from the convexity of the canal towards its ampulla. As the rotation continues, the endolymph will lag behind less and less, and eventually circulate at the same speed as the canal ; if now the turning be suddenly stopped, the endolymph will continue to move for a time (just as one stumbles forwards if a moving tramcar suddenly stops), but now the relative movement will be reversed : that is to say, it will be from the ampulla towards the convexity of

the canal, and this, as Ewald showed, will produce a nystagmus to the left. All movements of the endolymph in the horizontal canal of the opposite side will be in the reverse direction. Although both labyrinths are stimulated by rotation, Bárány states that the labyrinth on the same side as the direction of the nystagmus takes the larger share in its production. If therefore we wish to test the irritability of the left vestibular apparatus, we rotate to the right, and *vice versa*. We are thus able to compare the labyrinths of the two sides. The whole of the above has been well expressed by D. McKenzie—"The direction of the after-nystagmus is towards the side from which the patient has been rotated." If the head is inclined 90° towards the shoulder a vertical nystagmus is produced after rotation; if forwards or backwards a rotatory nystagmus, for now the posterior vertical and the anterior vertical canals are affected.

Caloric Nystagmus.—This is obtained by gently injecting cold (about 30° C.) or hot water into the external auditory meatus. It is found that cold water produces a mixed rotatory and horizontal nystagmus directed towards the opposite side, hot water towards the same side. If the head is completely inverted, the results are reversed. The explanation offered for this reaction is based on the well-known physical laws regarding convection currents. The labyrinth is looked upon as a vessel filled with fluid at a temperature of 37° C.; now, with the head erect, the summit of the anterior vertical canal is the highest point of the labyrinth, its ampulla is lower and situated nearer the exterior, where it would be cooled down first. As a consequence, the endolymph would tend to move from the convexity of the canal towards the ampulla—a condition of affairs which, as has been shown, would set up nystagmus directed towards the opposite side. In this reaction we have a valuable clinical test, for one labyrinth only is excited, and it can be applied to patients lying in bed. If the labyrinth is destroyed by operation or disease, no reaction can be obtained; the test is therefore of great assistance in certain cases in which the extension of a suppurative process in the middle ear to the labyrinth is suspected.

Nystagmus can also be produced in certain cases by rarefaction and condensation of the air in the meatus by means of a Siegle's speculum. If there is a breach or fistula in the labyrinthine wall, with a vestibular apparatus not yet destroyed, a nystagmus of several seconds' duration, and generally directed to the opposite side, will be produced. It is stated that, with an intact labyrinthine wall, minute ocular movements may be provoked but no marked nystagmus.

Nystagmus may also arise spontaneously, as in infective labyrinthitis, when it passes through three stages: (1) A short stage of irritation, with nystagmus directed towards the diseased side; (2) A stage of destruction, with nystagmus to the sound side; (3) A stage of disappearance of the nystagmus. Spontaneous nystagmus also arises from cerebellar abscess or tumour, extradural abscess, meningitis, or when the occipital convolution is subjected to pressure. An

important point of difference between infective labyrinthitis and cerebellar abscess is that in the latter spontaneous nystagmus is directed towards the diseased side, while in the former it is directed towards the sound side and tends to disappear.

Those desiring further details are referred to Bárány's original paper, or D. McKenzie's abstracts of the same.

REFERENCES.—Bárány, ext. by Thomas Guthrie, *Brain*, 1906; Bárány, *Physiologie u. Pathologie des Bogengang-Apparates bei Menschen*, 1907; S. Scott, *Jour. Laryng.* Apr. 1909; McKenzie, *Pract.* and *Jour. Laryng.* Feb. 1909; N. Pike, *Jour. Laryng.* Nov. 1908; R. H. Woods, *Med. Press*, June 9, 1909; E. J. Moore and P. Caugard, trans. by D. McKenzie, *Jour. Laryng.* Aug. 1909.

ŒDEMA (ACUTE) OF LUNG.

Joseph J. Perkins, M.A., M.B, F.R.C.P.

Chemery[1] lays down, as the two fundamental factors underlying this condition, excessive arterial tension and salt-retention, the latter favoured by the nephritis so common in the subjects of acute œdema of lung. As an exciting cause he postulates a sudden activity of the suprarenals, on the analogy of its experimental production by a large injection of adrenalin. As preventive treatment, he advocates the withdrawal of salt from the diet and the administration of **Theobromine.**

REFERENCE.—[1]*Thèse de Paris*, 1908.

ŒSOPHAGEAL DIVERTICULUM.

Robt. Hutchison, M.D.

Taylor[1] describes a case of this condition in which operation was successfully performed, and discusses the pathology and diagnosis.

ETIOLOGY.—Etiologically there are two varieties—traction and pressure diverticula. In the former the wall of the œsophagus is pulled outwards by the contraction of fibrous tissue formed in connection with some old-standing inflammation in a neighbouring structure to which the œsophagus had become adherent. Most traction diverticula are small, and are situated on the anterior aspect of the œsophagus, though they have also been observed on the posterior wall. They do not, as a rule, produce symptoms, because the apex of the diverticulum is at a higher level than the opening, so that food either does not enter the diverticulum at all or does not stay in it. Such a condition is said, however, to favour the development of carcinoma.

Pressure diverticula are produced, as the term implies, by pressure, and the mouth of the diverticulum is at a higher level than the sacculus itself; consequently food enters the pouch, and the tendency is for the diverticulum, having once formed, to continue to increase in size. They are situated at the posterior or postero-lateral aspect of the œsophagus at its junction with the pharynx.

Their production is said to be favoured by the physiological narrowing which exists at the level of the pharyngeal constrictor and the gap said to exist at that point in the longitudinal muscular layer. They vary in size, and may extend for a considerable distance into the thorax. They usually pass downwards towards the left, but may be met with on both sides. Something like a hundred cases have been

reported from time to time. Mr. H. T. Butlin has reported no less than eight cases upon which he operated, with one death. He states that he has notes of some six or seven others; that in his opinion they are not so rare as we have been led to suppose; and that it only requires the attention of practitioners to be directed to the symptoms for more cases to be recognized.

Symptoms.—In the early stages the patient complains of dryness, and a scratchy feeling in the throat, frequent hawking, nausea, expectoration of mucus, and a flow of saliva. Hawking brings up particles of food from the last meal mixed with mucus. A feeling of pressure may be experienced after taking solid food. After some time the sensation of the presence of a foreign body in the throat is experienced, and there is difficulty in swallowing. Small quantities of food regurgitate into the mouth, sometimes while eating, at other times after long intervals—for example, on getting up in the morning a portion of the previous night's supper may be regurgitated; this is a most important sign of the condition. Pressure on the side of the neck after eating or drinking may empty the contents of the pouch into the mouth. The regurgitated or ejected contents—unless when decomposition has taken place in the pouch—appear just as if recently swallowed. They are mixed with saliva and mucus, never appear digested, and are never mixed with stomach contents. Efforts to swallow may be associated with a gurgling noise in the pharynx owing to the escape of air from the pouch. Large diverticula, when distended, may produce dyspnœa and hoarseness from pressure, while the pressure upon neighbouring blood-vessels may produce congestion. The pressure of a distended diverticulum, if large, may obliterate the œsophagus so as to render further deglutition impossible. Decomposition of the contents of a diverticulum will produce great fœtor of the breath. These symptoms may not manifest themselves till late in life. Most cases are over 40 years of age and some 70 years or more. One case of Butlin's, operated upon successfully, was 73, and one case, also successfully operated upon by George E. Brewer, was 78 years of age.

Diagnosis.—This is made from the characteristic history, examination with the X rays after a bismuth meal, and by the œsophagoscope. Care must be taken not to mistake the case for one of malignant disease.

The Prognosis without operation is bad. The condition gradually gets worse, until death takes place from inanition, or until decomposition leads to suppuration and abscess, mediastinitis, or septic pneumonia. The condition may, it is said, lead to the development of cancer, the pouch itself becoming cancerous.

Treatment.—The correct treatment consists in the complete removal of the pouch. This operation does not tax the patient's strength or vital powers unduly, is simple to perform, and the results are eminently satisfactory.

Reference.—[1]*Brit. Med. Jour.* July 24, 1909.

ŒSOPHAGUS, SURGERY OF. *Rutherford Morison, F.R.C.S.*

Willy[1] Meyer considers that the previous causes of the unsatisfactory results of intrathoracic operations upon the œsophagus for malignant growths have been the advanced condition of the disease, the difficulty in preventing sepsis attacking the pleural and mediastinal cellular tissue, the absence of a pleural covering to the lower third of the œsophagus, and the lack of a safe method of operation.

By experimental intrathoracic surgery on dogs he has worked out a technique in which the leading idea is to avoid penetrating the wall of the proximal stump of the œsophagus laterally. Only in this way could he prevent the exit of even a drop of the highly infectious contents of the œsophagus above the stricture. There is no other way of accomplishing this than by implanting the temporarily tied proximal stump of the œsophagus into the stomach. He used Sauerbruch's chamber, the anæsthetiser being inside this under increased pressure, while the operator did his work outside of it under atmospheric pressure. The various steps of the operation, as carried out and recommended by the writer, are as follows :—

1. Incision best in the 8th intercostal space in order to be able easily to approach the cardia and determine whether the stomach can be properly pulled into the thoracic cavity. Rib spreader put in place. Of course, before this, the seat of the disease—which had previously been located with the help of the bougie, X-rays (bismuth) and œsophagoscope—is investigated by direct palpation.

2. Lung pushed upward and inward by gauze tampons, and œsophagus, with nervi vagi and aorta running along its side, comes into view.

3. The œsophagus is raised from its bed. The surgeon's left forefinger surrounds the œsophagus ; nervi vagi stripped off. In doing this the opposite thoracic cavity is frequently opened. No harm results therefrom when working under differential pressure.

4. Œsophagus with cardia is pulled up by the left hand, thus putting diaphragm on the stretch. An anatomical forceps is pushed parallel with and to the right of the œsophagus into the abdominal cavity.

5. By flexing second phalanx of thumb, which rests on the cardia, the stomach wall is rolled upward, grasped with anatomical forceps, and then pulled into the thoracic cavity by hand.

6. The rent in the diaphragm is grasped with a number of tenaculum forceps, care being taken to catch below the diaphragmatic peritoneum. This point is of very great importance, as only by including this part of the peritoneum can a rapid and thorough agglutination between stomach and diaphragm be expected.

7. Diaphragm stitched to stomach with the help of silk sutures, the assistant pulling on the forceps and the operator introducing his left forefinger into the abdominal cavity, receiving with the tip of his finger the tip of the needle. By thus guiding the tip of the needle, he will be sure that no other tissue comes within the grasp of the needle. Each suture, after having passed through diaphragm and

gastric wall, is closed at once, its ends being left long and secured by forceps. Special care must be taken to do this work thoroughly. No space should remain through which an abdominal organ might slip. If the distance between two sutures seems too long, additional, more superficial, intermittent sutures have to be placed. Every surgeon who has worked on dogs has a number of diaphragmatic herniæ to record that were found later on, and frequently were the cause of death.

8. Diaphragmatic sutures cut short; tampon placed on intrathoracic portion of stomach; with surgeon's forefinger again surrounding œsophagus, a circular incision is made with the knife down to the fascial part of the tube.

9. The muscular coat is pushed back, and the inner layer (fascia *plus* mucosa), surrounded by a silk ligature, placed as tightly as possible, and the œsophagus divided between this ligature and a clamp, with Paquelin's cautery.

10. The muscular coat is pulled over the divided end of the œsophagus by means of silk sutures. If the muscular coat appears thick, a curved needle introduced parallel with the longitudinal axis of the œsophagus may be used; of course, it must not pierce the lumen. If the muscular layer be thin, a straight needle may be pushed at right angles to the longitudinal axis from right to left anteriorly and posteriorly, thus forming a mattress suture, for closure.

11. These sutures are tied, the stump is dropped back, and a gauze tampon placed on top. The intrathoracic part of the stomach is raised, gently milking downward, and a curved long forceps with blades protected by rubber tubing, as used for gastro-enterostomy, is placed transversely around the stomach close to the diaphragm. Second intercostal incision in 5th interspace; œsophagus ligated with rapidly absorbable catgut, making a single knot on either side, then securing the ends with a clamp; or making an ordinary double knot on one side only, with ends cut short, a clamp placed distally; division with scissors. The cut end of the œsophagus is immediately mopped with lysol solution.

12. The stump of the divided œsophagus is drawn up by means of two forceps, with narrow tip and *without* mouse-teeth, best placed before dividing the tube, and a narrow compress of moist gauze placed in the depth of the wound from right to left, as we are wont to do in performing gastro-enterostomy; the wall of the stomach is stitched to the posterior wall of the œsophagus by means of a number (five to seven) of silk sutures. The two placed at the extreme end are left long and secured by forceps; the others are cut short.

13. Transverse incision through seromuscular coat of stomach in horizontal direction, three-fourths inch in front of these sutures. If the stomach appears to be thick, an ellipsoid excision of the two upper gastric layers may be made. The mucous membrane of the stomach is not yet divided. The upper lip of this wound nearest the œsophagus is stitched above the first layer of sutures to the œsophagus, securing

further proper adaptation of the two organs to be anastomosed. They are cut short.

14. The lower lip of stomach wound, exclusive of mucosa and anterior wall of œsophagus, caught by five silk sutures, but not tied as yet, the middle portion and the two ends of the thread being caught by an artery clamp.

15. Three of these sutures are pushed to the left and two to the right, or *vice versa*, in order to expose the mucous membrane of the stomach, which is now incised transversely for about $\frac{3}{4}$ in. with scissors or knife. The gastric mucosa is mopped clean with a small piece of gauze soaked in lysol.

16. Œsophageal stump introduced into stomach. The five sutures placed before are now drawn tight, the middle one being the last. The latter is tied immediately after the clamp which has introduced the œsophagus has been gently withdrawn. A number of additional sutures are placed to secure the proper implantation of the œsophagus into the stomach.

17. Second row of anterior sutures bringing into apposition the serosa of the stomach and part of the œsophagus further up.

18. Tampons removed and œsophagus allowed to slip back into its normal position next to spinal column. The lower border of pleura is caught with forceps, pulled over the seat of the anastomosis, and stitched to the stomach, thus hiding the suture line from view and placing the anastomosis into the posterior mediastinum. Care must be taken not to enclose the loop of the nervi vagi.

Excellent illustrations of the various steps of the operation are given. He suggests that where a patient is weak the operation should be done in two stages.

REFERENCE.—[1]*Ann. Surg.* July, 1909.

OSTEO-ARTHRITIS. (*See* ARTHRITIS DEFORMANS.)

OSTEOMALACIA.

(*Vol.* 1909, *p.* 446)—Adrenalin is recommended by Bossi. It should be given subcutaneously, once a day at first, then twice daily if no ill effects are seen. The dose should be ·5 cc. of a 1–1000 solution.

OVARY, DISEASES OF. *Victor Bonney, M.S., M.D., F.R.C.S.*

Ovariotomy.—Munro Kerr[1] describes the difficulties and dangers met with in 250 ovariotomies performed by him. He first draws attention to the mortality, 4·4 per cent, as compared with 2 per cent in a series of 150 hysterectomies. The operation of ovariotomy is now-a-days the more serious undertaking. Adhesions were present in 55 of his cases, and in 3 of them the bowel was opened in the course of the operation. Rupture of the tumour prior to operation was found in 3 cases, torsion of the pedicle in 14, and the coincident presence of uterine myomata in 10. Haultain, discussing the paper, agreed that ovariotomy was a more dangerous operation than hysterectomy. The principal risks were adhesions to the bowel, and injury

to the mesentery. The gynæcologist should be competent to deal with any surgical emergency arising in the course of an operation.

Tumours of the Large Intestine simulating Disease of the Uterus and Appendages.—Victor Bonney[2] has published an account of five cases under his care in which tumours of the large intestine simulated disease of the uterus or its appendages. The first case was that of an inflammatory mass in the cæcum producing what was deemed to be a uterine myoma. The cæcum and a portion of the ileum were successfully resected. The second was an example of carcinoma of the transverse colon with an implantation growth in the sigmoid that gave all the physical signs of a malignant ovarian cyst. Both growths were successfully removed. In the third a large carcinoma of the sigmoid colon lay between the uterus and bladder of a young girl. A diagnosis of dermoid cyst of the ovary was made. The growth was resected with a good result. The fourth case was also a carcinoma of the sigmoid, which had adhered to the right broad ligament and simulated an inflammatory enlargement of the appendage on that side. The growth was excised and the patient recovered. The fifth case was that of the successful excision of a primary carcinoma of the sigmoid colon which had adhered to the anterior face of the rectum on the floor of Douglas' pouch, and infiltrated the wall of the bowel there. It was considered to be a malignant ovarian growth before the operation. The author points out the frequency with which these mistakes in diagnosis are made. There is a great tendency for tumours of the large intestine to gravitate downwards and become adherent to the pelvic organs. Omentum and other coils of intestine are nearly always found more or less conjoined to the diseased and distended bowel, and the whole forms a large mass, of which the primary neoplasm is only a small part. The symptoms may be very indefinite, as in the cases described by him. The lesson to be learnt from them is, therefore, that a gynæcological surgeon should be competent to perform intestinal anastomosis.

Spontaneous Rupture of Ovarian Cysts.—Briggs,[3] discussing the spontaneous rupture of cyst-adenomatous ovarian tumours, urges: (1) That the primary cause of the cyst rupture is necrosis; (2) That the rarity of cyst rupture is dependent upon reparative adhesion to the wall of the degenerated cyst. That a cyst wall can heal after rupture is shown by the records of from sixty-six to eighty tappings in the pre-ovariotomy days. He analyzes the symptoms of four cases in which spontaneous rupture occurred. In all of them the health of the patient was impaired out of proportion to the size of the cyst. This Briggs considers to be due to the effect of the degeneration of the cyst wall. The absolute diagnosis can only be made when a partially filled cyst can be felt in association with free intraperitoneal fluid; but it may be suspected if impairment of the health out of proportion to the tumour is present, together with abdominal pain, variable distention of the abdomen, and irritability of the bladder.

Ligature of the Ovarian Vessels.—Gray[4] advises ligature of the

ovarian vessels as a substitute for oöphorectomy in the treatment of severe ovarian pain. He strongly deprecates the removal of healthy or quasi-healthy ovaries for such conditions. The removal does not, in many instances, stop the pain, whilst it exposes the patient to all the drawbacks of a premature menopause. The ligature and division of the ovarian vessels includes, of course, the nerves that accompany them, and to this he attributes the beneficial results of the operation. He has performed it 17 times, with satisfactory results in 15 cases. The vessels are ligatured by passing on each side two fine silk threads round the ovarico-pelvic ligament, and dividing it between them. Where ovarian prolapse co-exists, this portion of the ligament is resected, and the ends of the ligatures are tied together (as in the operation for varicocele), the ovaries being thus pulled up into normal position.

Ovarian Actinomycosis.—F. Taylor and Welby Fisher[5] record an interesting case of primary ovarian actinomycosis. Only six examples of this rare condition are on record. The patient, a single woman, aged 34, had had symptoms of pain and profuse sweating for a long time. More than a year before her admission to hospital, the right ovary was known to be enlarged. After removal by operation, it presented the typical honeycomb appearance of a streptothrix affection, and sections showed the condition to be due to a variety of this class of organism. Some four years previously she had been brought in daily contact with hay, straw, and corn, in a stable in which she had work to perform. The organism probably entered through the tonsil and found its way to the ovary, *via* the blood-stream.

References.—[1]*Lancet*, May 22, 1909; [2]*Ibid.*; [3]*Brit. Med. Jour.* June 19, 1909; [4]*Brit. Jour. Obst. and Gyn.* July, 1909; [5]*Lancet*, Mar. 13, 1909.

PANCREATITIS. *Robt. Hutchison, M.D.*

The Pancreatic Reaction.—Diverse opinions continue to be expressed as to the value of the Cammidge reaction in the diagnosis of pancreatitis. Kehr,[1] who has a large experience, finds that it affords correct indications in at least 80 per cent of the cases, but it is probably more trustworthy in chronic than in acute pancreatitis. Caro and Wörner[2] also report in its favour, but only on the strength of two cases. They believe that glycuronic acid is concerned in producing the reaction. Kinnicutt,[3] from a study of many publications on the subject, comes to the conclusion that while the "pancreatic reaction" is not pathognomonic, it is highly suggestive of inflammatory and destructive lesions of the pancreas and is of much assistance in diagnosis if taken in conjunction with other clinical evidence. Fiorio and Zambelli[4] agree with this conclusion. On the other hand, Eichler and Schirokauer,[5] from their experiments on dogs, found that the reaction was very uncertain. Goodman,[6] who is one of the latest writers on the subject, concludes, from a study of sixty-two cases, that the test, though not pathognomonic, is a very useful one when taken in conjunction with the clinical evidence.

Treatment.—Acute pancreatitis, as Dreesman points out,[7] is, if untreated, almost always fatal. Death is the direct or indirect result of the action of the pancreatic ferment upon the tissues, acting either directly upon these, or being carried thereto by the blood or lymph-vessels, but in exceptional cases cure by means of conservative, purely symptomatic treatment (washing out the stomach, irrigation of rectum, administration of oleum ricini) is not impossible. The hopes raised of immunization by means of trypsin and by serum-therapy have not yet been realized. Dreesman recommends **Opening the Omental Cavity** through the gastro-colic ligament. The cut should be between the ensiform process and the navel, or a little more to the left, according to the site of the greatest sensitiveness to pressure or resistance. A blood-stained peritoneal exudate, if incarceration or mesenteric thrombosis can be excluded, in all probability signifies pancreatitis, and justifies opening the omental sac. The inflamed gland and peritoneum should only be incised when the pancreas is much swollen, and its peritoneal covering uninjured, otherwise severe hæmorrhage, only controlled with difficulty, may result. A suspected focus of suppuration may always be punctured. Dreesman recommends drainage down to the surface of the gland by gauze plugs, which can be changed several times a day, and if the secretion is very great (for example, ½ litre or more) a drainage tube in addition. Washing out the abdominal cavity is not recommended unless the patient's condition, and especially the pulse, is good, which is not generally the case; moreover, the mesentery in these cases is very easily torn. Drainage of the bile-duct may be useful, even in the absence of gall-stones, when the gall-bladder contains abnormal bile resembling tea. As Robson recommends, calcium chloride is useful in lessening hæmorrhage, and may be given in doses of 30 to 60 grains thrice daily for one to two days before the operation, and 60 grains thrice daily by rectal injections, after the operation, for two days. If in eight to fourteen days a fistula has formed, a tube usually suffices for drainage. Action on the skin may be prevented by antiseptics (airol, viroform), and in one case Burmeister used a special aspirating pump with success. The diet should be regulated. Secretion from the pancreatic fistula is very profuse after carbohydrates, less after albuminous foods, ceases after fatty diet, is excited by hydrochloric acid, and is hindered by sodium bicarbonate. Of 118 cases, taken from the literature, in which operation was undertaken, including Dreesman's own 5 cases, 40, it appears, were treated with tamponade of the pancreas; of these only 8 died (20 per cent). Recovery took place in 53 of the 118 cases, the mortality being 55 per cent.

In chronic pancreatitis special diet and administration of **Pancreas Preparation** are useful. Schmieder recommends **Iodide of Potassium**; Robson, in cases of obstinate constipation, **Calomel,** followed by saline purges, and later by **Bismuth subnitrate** and small doses of **Opium.** In many cases operation becomes necessary, on account of great emaciation or pain, and its nature will depend on the cause

of the pancreatitis. When dependent upon cholelithiasis, its most frequent cause, cholecystotomy or cholecystenterostomy should be undertaken.

In the early stages of chronic pancreatitis, according to Chalmers Watson,[8] the inflammation subsides under simple measures. The diet should be a light one, and in cases where gastric symptoms are present an exclusive **Milk Diet** may be advisable for some days. Small doses of **Calomel** frequently repeated, followed by a morning saline for two or three days, act beneficially in promoting a healthier state of the liver and small and large intestines. Where constipation is present, as it often is, one or more enemata may be called for. The pain may be relieved by ice-bags, hot fomentations, or, if necessary, subcutaneous injections of morphine. The excretory functions of the skin should be stimulated by an occasional Turkish bath, provided always that due care is taken in recommending such a measure, and explicit instructions given with regard to the necessary details. In the later stages the same rules apply. The diet should be carefully attended to: three meals a day at long intervals, sugar and starches being restricted, and protein foods forming the staple of the dietary. With regard to drugs, in addition to calomel much value attaches to **Lacto-bacilline** in the form recommended by Metchnikoff. An improvement in the state of the intestinal excretion may be rapidly attained, and is shown in the character of the stools, which become formed and free of offensive odour. A course of intestinal irrigation has value in the same direction. In these cases it is of even greater importance to promote the functions of the skin and kidneys by appropriate baths and occasional diuretics. He has seen no decided benefit from the use of pancreatic extracts.

REFERENCES.—[1]*Münch. med. Woch.* No. 21, May 25, 1909; [2]*Berl. klin. Woch.* No. 8, Feb. 22, 1909; [3]*Med. Rec.* Apr. 10, 1908; [4]*Il Morgagni*, Sept. 1908 (ref. in *Münch. med. Woch.* Dec. 8, 1908); [5]*Berl. klin. Woch.* No. 8, Feb. 22, 1909; [6]*Ann. Surg.* Feb. 1909; [7]*Med. Klin.* Oct. 4, 1908 (abst. in *Brit. Med. Jour.* Epit. Jan. 2, 1909); [8]*Lancet*, Nov. 21, 1908.

PANCREATITIS, SURGICAL TREATMENT OF.

Rutherford Morison, F.R.C.S.

The pathology of pancreatitis is not special to the pancreas; it is the pathology of inflammation elsewhere in the body. On general principles, there is no difficulty in understanding it; all the difficulties have arisen from a neglect of these, and the use of long names to indicate the various changes in the pancreas. The causes of inflammation are the same as they are everywhere, and the terminations are also the same. All acute surgical inflammations are the result of infection with organisms, and the termination is either in resolution, fibrosis, partial destruction (sloughing and suppuration), or total destruction (gangrene). The only change peculiar to the pancreas is the frequent occurrence of hæmorrhage into its substance in the most acute attacks, and probably the best explanation that can be offered for this is that it is due to the digestive action of the ferments

set free on the blood-vessels and any thrombi which would otherwise occlude them. During operations for gall-stones, it is not uncommon to find evidence of pancreatitis and fat necrosis, and these patients recover as quickly and as well as they would have done after an ordinary gall-stone operation. From this we learn that pancreatitis is not so fatal a disease as has been supposed, and that it is much more common than is generally recognized. It should always be borne in mind when the diagnosis of an abdominal emergency has to be considered, and if the history, symptoms, and signs do not exactly fit acute intestinal obstruction, or stomach or duodenal perforation, or perforating appendix, or acute cholecystitis, and yet have some resemblance to each of them, that pancreatitis is the most probable cause. In the acute variety, beyond free drainage of the hepatic pouch, the less that is done the better; in the chronic form, the probability that a small gall-stone in the end of the common duct is the likely cause, even though it cannot be discovered during the operation, should be remembered, for this is the explanation of the good results of cholecystenterostomy in these cases.

W. D. Haggard and John B. Deaver[1] refer to recent gains in knowledge of the pathology, diagnosis, and treatment of pancreatitis. It is so frequently associated with gall-stones, and especially when they are in the common duct, that the two are often found together. If an impacted gall-stone does not cause bile to enter the pancreas direct —and it has been proved that this may cause pancreatitis—obstruction and retention of the pancreatic secretions, if infected, will set up inflammation. The acute type is sudden and severe in its onset, attended with agonizing pain and extreme prostration. The pulse is rapid, the temperature high, vomiting persistent, the lips livid, the extremities cold, and the entire body is of a cyanotic leaden hue. [This is an important sign when present.—R. M.] There is no glycosuria. [This is not correct for every case.—R. M.] The patients die in from forty-eight to seventy-two hours, and are mostly stout, about the age of fifty, and addicted to alcohol. The diagnosis has been in error in the great majority of cases, and every disease that can produce the most acute mischief in the abdomen has been mistaken for it. Of patients not operated upon, 90 per cent died. Of those operated upon, 52·8 per cent survived. The characteristic change observed on opening the abdomen is fat necrosis. Whitish opaque spots are seen on the surrounding fat.

In the subacute or suppurative form, the onset is less sudden and severe. Chill, fever, leucocytosis, and an epigastric tumour, with large fatty stools, are the chief diagnostic points. Chronic pancreatitis generally occurs in persons who have a gall-stone history. There is epigastric tenderness, and possibly induration, pain referred to the left side, extreme loss of weight, jaundice with pigmentation of the skin, the motions contain quantities of undigested food, are light in colour, greasy, bulky, and alkaline. Cammidge's reaction (urine) is present. It is difficult to distinguish from cancer. If there are ascites

and œdema, a distended gall-bladder, hæmatemesis and melæna, or enlarged cervical glands, these suggest cancer. When the gland has become replaced by scar tissue, sugar is found in the urine.

Operation is the treatment of pancreatitis. If this is due to gall-stones the removal of these and drainage is proper; in acute cases drainage through the gall-bladder and of the abdomen. In chronic cases where the diagnosis between pancreatitis and malignant disease is uncertain, cholecystenterostomy ought to be performed.

M. Albert Dreifuss,[2] records three cases. The first is that of a youth of nineteen, who while riding a bicycle was struck by the shaft of a carriage over the epigastrium. Next day he was admitted to hospital, complaining of pain in the belly, though at that time there was no indication of any intra-abdominal lesion. The day following he was very ill. Meteorism, abdominal tension, fever, with weak pulse, were the chief indications for a laparotomy, which was immediately undertaken. This was forty-two hours after the accident. A plaque of fatty necroses was first noticed on the mensentery. Then a great quantity of liquid black blood was found in the belly, and the omentum was observed to be spotted over with necrotic plaques. The region of the pancreas was represented by a cavity full of clots and liquid blood. These were cleared out, and firm tamponnement resorted to in order to arrest the hæmorrhage from the cavity walls. Leaving room for gauze drainage, the abdominal wound was closed. For a few days the patient suffered much from pain and general distress. The discharge was abundant. By the fifty-sixth day the fistulous track was closed. The operation took place in August, 1904, and in July, 1907, the patient was seen in perfect health. The other two cases were of rupture following acute pancreatitis. After operation both recovered perfectly, the fistula in one case healing in three months, in the other in 126 days.

The traumatic case above recorded was the twenty-third in number of cases actually published of simple rupture of the pancreas, or of those associated with no further injury than of tearing of the gastro-colic and gastro-hepatic ligaments. Sixteen of these were treated by operation, with 11 cures and 5 deaths. (Twice the pancreatic rupture had not been discovered.) In 3 cases intervention was too late. The seven cases in which no operation was done were all fatal. Attention is specially drawn to the efficacy of firm tamponnement for the control of hæmorrhage.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* Aug. 1908; [2]*Sem. Méd.* Nov. 18, 1908.

PARALYSIS, FACIAL.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

In a case in which the facial nerve was unfortunately divided in the course of the radical mastoid operation, Sydenham[1] two days later opened up the wound and exposed and defined the two ends of the severed aqueduct. He then introduced a piece of silk-worm gut so that its ends lay each in the aqueduct, and it formed a scaffolding for

the regenerating nerve. The ear was dressed daily through the post-auricular wound, great care being taken not to disturb the silk-worm gut. Three months later, on forced sniffing, slight movements of the alæ nasi of the affected side were noticed. At the time of writing, the boy had completely recovered his normal facial expression when at rest, and only careful examination could detect any paresis on movement. This method has advantages over the facio-hypoglossal anastomosis in the absence of an unsightly scar and the much shorter time required for regeneration, and recovery of muscular control.

REFERENCE.—[1]*Brit. Med. Jour.* May 8, 1909.

PARALYSIS, SPASTIC. *Purves Stewart, M.D., F.R.C.P.*

Spastic paraplegia is associated with sclerosis of the cortico-spinal pyramidal tracts of the cord. If, however, the posterior columns of the cord subsequently become affected, it is not uncommon to observe the spasticity of the limbs diminish or even disappear. Moreover, if the posterior columns are already diseased, as in tabes, a later affection of the pyramidal tracts no longer induces spasticity or contractures.

Förster accordingly came to the conclusion that if the reflex arc be divided, the spasticity and contractures ought to become alleviated. The only accessible part of the arc which can be divided without damage to the motor functions is the posterior root. And inasmuch as a muscular group is usually innervated from three adjacent segments of the cord, he concluded that the division of one root alone would not totally destroy the reflex arc, but might merely diminish the reflex tonus, and so relieve the spasticity and contractures. Gottstein[1] has operated on two patients with spastic contractures with encouraging results. The first case was one of diplegia of ten years' duration, apparently resulting from encephalitis, in a young man aged 24. Both legs were paralyzed, spastic, and with severe contractures. The left arm was also weak. Several posterior roots were divided, viz., the 2nd, 3rd, and 5th lumbar, and the 2nd sacral, on both sides. Immediately afterwards, the spasticity ceased, whilst sensation remained intact. The motor power of the legs was considerably improved. The flexor tendons at the knee were divided later, to correct pre-existing contractures, and the knees were straightened and put up in plaster. The patient regained the power of walking, though with some difficulty. The second case was in a girl of 19, who had a history of meningitis five years previously, followed by spastic diplegia, much more marked on the right side. Wassermann's syphilis test was negative with the blood-serum but positive with the cerebrospinal fluid. The 2nd, 3rd, and 5th lumbar roots and the 1st sacral root on the right side were divided. The spasms of the legs at once disappeared, and the patient could freely move the legs. Some days later, however, a flaccid paralysis of the right leg set in, together with aphasia and twitchings of all the extremities. Under energetic mercurial treatment, the aphasia and paralysis disappeared, and she became able to move actively her previously spastic legs.

Hitherto, Förster's operation has chiefly been tried in cases of children, as in two cases of diplegia and one of paraplegia from Pott's disease,[2] but these two cases are interesting as indicating the possibility of its application to adult patients. But it is necessary to exercise great care in selecting suitable cases, for in one of Förster's[2] patients, a woman with paraplegia from disseminated sclerosis, the patient, so far from being improved, developed complete anæsthesia from the waist downwards, together with paralysis of sphincters, and a bed-sore which became infected and caused death. Another case of old-standing hemiplegia in a man of 45, produced severe flaccid paralysis of the upper limb, followed by some improvement in the form of increased extension of the elbow. Förster himself admits that the operation is more suitable for spastic affections of the lower extremities.

REFERENCES.—[1]*Berl. klin. Woch.* Apr. 26, 1909, p. 784; [2]*Mittheil a. d. Grenzgeb. der Med. u. Chir.* 1909, vol. xx. p. 493.

PASSIVE HYPERÆMIA. *Priestley Leech, M.D., F.R.C.S.*

A. W. Wakefield[1] gives his experience of the use of Bier's method. As regards **Rheumatoid Arthritis,** of 20 cases there were only 2 that congestion was not able to relieve in some way; in most cases the pain is relieved in a striking manner, and the improvement continues for some weeks, when the patients seem to acquire a tolerance to congestion and the pain begins to recur. After stopping treatment for a week or two, the bandage again gives more or less relief in some cases, while in others it seems to lose all effect. Stiffness is benefited by congestion in only a small proportion of cases, and in some of these the improved motility is only temporary. Swelling appears to be very little affected by congestive treatment, but Wakefield thinks swelling cannot be taken as a gauge of the result of treatment. Success has been best gauged by the relief of the pain. Recently he has (in suitable cases) only ordered the application of the bandage when the pain comes on, and a close personal supervision is an absolute necessity if the best results are to be obtained. It has been found advantageous to combine other forms of treatment with congestion, e.g., full dieting, cod-liver oil, malt, iron, arsenic or quinine, and the local employment of massage and passive movements and a woollen wrap to protect from cold.

In Tubercle and Mixed Infections an hour's congestion daily is generally sufficient, and in children even less. In the cases of joints except the knee and ankle, immobilization is not used, and in these joints the splints are put on to avoid strain and removed for passive movements. In cases of tuberculous sinuses and abscesses which have been opened, the suction treatment has proved successful; but during the suction the sinuses must not be plugged, as there is a good deal of discharge. In addition, the general health must be improved by tonics, etc., and by fresh air. The contraindications to conservative treatment by congestion are: (1) Commencing amyloid disease and advanced phthisis; (2) Large abscesses, filling the whole joint cavity and demanding operation; (3) Faulty position of the joint, so that

cure would give a result less useful than that obtained by resection. If congestion causes the part to become colder and to appear white and shiny, either congestion has been wrongly produced or the case is not suitable for this treatment.

Sepsis.—In many cases, as boils, carbuncles, etc., Wakefield is unable to find any great advantage in this form of treatment; he thinks the usual procedure of incision, evacuation, and fomentation is quite satisfactory and much more simple than suction for three-quarters of an hour daily. In acute sepsis, including osteomyelitis, it gives good results, and it is of great use as a prophylactic in lacerated and other wounds which have become infected by pyogenic organisms. Effective drainage must be provided; the congestion must never cause, but alleviate, pain, and the part should be continuously congested for eighteen, twenty, or twenty-two hours daily. During the intervals between the daily periods of congestion the part should be kept elevated to aid the absorption of œdema.

Mastitis.—This is treated by suction apparatus; Wakefield has generally employed a negative pressure of about 1½ in. of mercury, running sometimes up to 2 in. or more. Treatment is ordered for three-quarters of an hour daily at first, and as the case improves the number of sittings is gradually diminished. Any form of mastitis or mammary abscess may be treated in this way; in abscesses the pus should be evacuated and free drainage provided; the cavity must not be plugged with gauze. When the breast is swollen and tender, and it is not easy to say whether pus is present or not, congestion is of the greatest value; special care must be taken that the skin does not close too soon over the sinus.

Gout.—In chronic gout congestion has much the same results as in rheumatoid arthritis. In acute gout it often relieves the pain in a few minutes; medicinal treatment should be given at the same time.

In **Gonorrhœal Arthritis** the improvement was extraordinary in three acute cases; in chronic cases it is less serviceable.

G. Burnside Buchanan[2] has tried congestion in various septic conditions. In **Cellulitis** of the arm, out of 20 cases only 4 have not done well, but even these did distinctly better than if treated in other ways. Cases of cellulitis of the lower limb have not given such good results, partly perhaps because they were more chronic, and partly because in many cases it was more difficult to apply the bandage. In **Arthritis** the results have not been so good, and in acute osteitis the cases were seen too late to be aborted; in these, the general practitioner has the best chance of limiting or aborting the disease. In **Chronic Osteitis** the treatment does not appear to do very much good. In commencing **Whitlow,** the treatment by cupping-glass often aborts the disease, and in boils and carbuncles is also of use. In **Sinuses** and **Abscesses** good results have been obtained; the most striking have been in **Mastitis,** by means of cupping-glasses applied over the whole organ. The cup is applied morning and evening for short periods of five minutes or so, with a

few minutes' interval, until an aggregate time of half an hour is taken for the sitting. After a little experience the patient can adjust it, and the apparatus be used at home. Good results are also obtained in **Tenosynovitis** and **Joint Affections.**

Daniel[3] thinks very highly of this method, and says that failures are often due to want of familiarity with the technique. Above all things avoid increased pallor, coldness, and any sensory changes. A minimum of dressing is employed, and if possible he thinks it better to expose the wound to the air and wipe away the discharge.

R. Dupont[4] has tried Bier's method in fourteen cases of **Surgical Tuberculosis,** with uncertain and mediocre results, and the cupping-glasses seem to be more useful as they are used in open tuberculous lesions; the use of the bandage in closed lesions he thinks may be dangerous.

Iselm[5] says both the hot-air bath and the stasis hyperæmia give good results, but the latter can only be employed in hospital. In streptococcus infections it has been found dangerous.

References.—[1]*Pract.* Oct. Nov. & Dec. 1908; [2]*Lancet*, Nov. 14, 1909; [3]*Folia Therap.* Apr. 1909; [4]*Rev. de Chir.* Feb. 10, 1909; [5]*Münch. med. Woch.* Apr. 20, 1909.

PELLAGRA. *J. W. W. Stephens, M.D.*

W. S. Thayer,[1] in drawing attention to the existence of pellagra in the United States, especially in the South, gives a useful summary of the symptoms of the disease :—

Alimentary Tract.—Nausea, indefinite symptoms of dyspepsia, vomiting, and especially diarrhœa. Stomatitis is very characteristic, and may be very severe. The mucosa is a bright red, ulcers form, patches of white epithelium exfoliate, and raw, fiery-red ulcers are left beneath.

Cutaneous Symptoms.—Erythema begins on the back of the hands or the dorsum of the feet, if these are uncovered. It resembles a symmetrical sunburn. The affection spreads as far as the proximal interphalangeal joint downwards, just above the wrist upwards. The skin in the affected areas becomes dry and scaly, and exfoliates. In some cases bullæ develop. Raw surfaces are exposed. Deep cracks and fissures are formed, often hæmorrhagic. In well-marked cases the skin of the last phalanges becomes dry and deep brown in colour.

Nervous Symptoms.—Vertigo is common. The deep reflexes may be increased. Spastic symptoms occur, and in some cases paralysis of the sphincters. The reflexes of the lower extremities may be lost, those of the upper extremities increased; mental phenomena are well marked. There is weakness of will, anxiety, depression, hypochondriasis. The expression is dull and serious. Depression and stupor may give place to emotion and restlessness. Hallucinations are common. Finally, dementia ensues.

The disease runs either an acute course with delirium, fever, and uncontrollable diarrhœa, or a chronic course lasting twenty-five years.

Seasonal Relations.—A remarkable feature of the disease is its onset in the spring months (in Italy). The patient improves in the summer,

after October the symptoms entirely disappear until the following spring, when there is a recurrence.

Etiology.—Opinion is divided into two groups, those who believe that maize or " spoiled " maize is the cause, and those who do not.

REFERENCE.—[1] *Johns Hop. Hosp. Bull.* July, 1909.

PEMPHIGUS. *E. Graham Little, M.D., F.R.C.P.*

MacLeod[1] essays a simplification of the classification of diseases under this name, but it is probable that the time is not ripe for any general consensus of opinion, and the group of bullous diseases remains very inchoate. It is at least certain that a few diseases still classed under the heading of pemphigus have nothing in common with the disease to which that name is still universally given. Pemphigus syphiliticus, which is a bullous syphilide, and pemphigus neonatorum, which is a bullous impetigo, should be removed from this category. The exact position of dermatitis herpetiformis in the group of bullous diseases is becoming more and more disputed; its separation from pemphigus was probably premature, and at any rate none of the criteria which are usually quoted, and of which MacLeod gives a good summary, are satisfactory distinctions, or indeed reliable. What diseases may be said to remain in the pemphigus group it would be difficult to say with certainty; probably most authorities would accept the group of chronic pemphigus, with its rare clinical subdivisions of pemphigus foliaceus and pemphigus vegetans. Pemphigus acutus, under which MacLeod includes the group of cases occurring in butchers, and showing the presence of a micro-organism (Demme's diplococcus), would probably not be so widely accepted as true pemphigus. It would appear rather to be a variety of septicæmia. MacLeod disposes of the contention that the position of the bulla in the skin, according to whether it is sub- or intra-epidermal, offers any criterion of diagnosis. The presence of eosinophiles in disproportionate abundance is another symptom which, formerly relied upon for differentiation, has been demonstrated to be unreliable.

I append a reproduction (*Plate XLI*) of a case of pemphigus foliaceus in a woman who was under my care at St. Mary's Hospital for many months, and who made a complete recovery after many recurrences.

Ward[2] describes a particularly interesting case of hydroa gestationis. The patient had had a repetition of the eruption in eight successive pregnancies, these occurring with remarkable regularity every year for eight years. The eruption was of the usual erythemato-bullous type, and was distributed in a " band " round the legs at each recurrence; the month of December was the time at which it most often recurred. The onset varied as regards the date of pregnancy, in some cases coming in the earlier months, in one instance during the puerperium. Hydroa gestationis is now usually regarded as a clinical variety of dermatitis herpetiformis; the connection with pregnancy is ascribed to the absorption of toxins produced by that condition.

Foerster[3] opened a discussion at the section of dermatology of the

PLATE XLI

PEMPHIGUS

E. Graham Lutle, M.D.

American Medical Association on the subject of pemphigus neonatorum, and supported the view long held by many authors, of the identity of this disease with impetigo contagiosa. Whether, as in this latter affection, streptococci are always the initial infection, has not been demonstrated. While the term "impetigo contagiosa" is used as loosely as it commonly is, to include many general pus infections, the exact meaning of any individual author has to be ascertained; and it would be well if the name of impetigo contagiosa could be restricted to the streptococcal infection described by Sabouraud. The mortality of pemphigus neonatorum may be considerable, varying from 10 to 50 per cent according to Foerster. He suggests that these facts warrant notification of the disease, with attendant municipal control. The treatment recommended is as follows: The vesicles and bullæ are opened and drained of their contents, the edges of the lesions thoroughly exposed, the entire base freely anointed with 2 per cent **Ammoniated Mercury Ointment,** and the lesions dressed with gauze. To secure asepsis of the uninvolved surface the infant is bathed in warm **Permanganate Solution** and sprayed with this whenever the dressings are changed.

REFERENCE.—[1]*Pract.* Mar. 1909; [2]*Lancet*, June 20, 1909; [3]*Jour. Amer. Med. Assoc.* July 31, 1909.

PERITONITIS.

John B. Deaver, M.D., LL.D.
Astley P. C. Ashhurst, M.D.
} *Philadelphia.*

F. Moty[1] reviews the evolution of the surgical treatment of peritonitis from the time when operative cure was first attempted as a routine practice (in the late eighties) to the present time, when most practitioners recognize that the disease is so uniformly fatal if left to itself that they no longer hesitate to counsel operation as soon as possible. The improvement in the results, he thinks, is due chiefly to the earlier resort to operation; but this is not the only reason, as contemporary statistics diverge too widely, in the same country, and under apparently similar circumstances. Cases caused by appendicitis form the largest proportion of these statistics, and the results in this class are the best, both from inherent characteristics of the lesions, and because the surgeon has more practical experience with these than with the rarer cases due to perforated gastric, duodenal, or typhoid ulcers, or to puerperal and pelvic diseases. From 65 to 79 per cent of cases of diffuse peritonitis are caused by appendicitis. To render future statistics of value, it is important that the cases be classified as to cause, and that the "precocity of the intervention" be recorded. Nötzel in 1905 published his results as follows:—

Cases	Due to	Deaths	Mortality
165	Appendicitis	81	49 per cent.
38	Pyosalpinx	13	34 ,,
5	Puerperal metritis	3	60 ,,
6	Cholecystitis	4	66·6 ,,
12	Gastric perforation	6	50 ,,
11	Intestinal ,,	11	100 ,,

Moty then contrasts the death-rate of 49 per cent reported by Nötzel, for diffuse peritonitis due to appendicitis, with the death-rate of 4 per cent reported by Murphy in 1908. Seeking for an explanation of this marked difference, he notes first that in Murphy's series the period from the commencement of the peritonitis to operation did not exceed 40 hours; while Nötzel fixed at three days the limit of time within which operation might still offer some chances of success. Another point is that Nötzel's cases were treated from 1891 to 1905, and that if only the three latter years of this period were considered (1903–05), his death-rate was only 33 per cent. But even if all these facts, and the possibility that Nötzel's cases were more seriously ill from the outset, be admitted, it nevertheless remains clear that Murphy's results must be due to some differences in the technique of operation and after-treatment. He quotes Lennander's dictum that "it is the infection which kills, and the peritonitis that saves," as showing the modern conception of the value of the reaction on the part of the peritoneum. He thinks, therefore, that in cases of perforation of the gastro-intestinal tract, with escape of bowel contents, it is proper to remove these by rapid wiping with sterile gauze, and by local lavage, if the abdomen is opened before peritoneal reaction has been provoked; but that in cases of appendicitis where peritoneal reaction has already commenced, it is harmful to attempt to remove the exudate, which may be regarded as perfectly benign, containing myriads of leucocytes and quantities of bacteriolysins and other antibodies. To show the harmfulness of irrigation in such cases, he quotes Fowler's statistics (33 per cent mortality) in cases treated by irrigation, and compares them with Murphy's (4 per cent mortality) in cases treated without any attempt at removal of the exudate. He says that Rémy, ten years ago, urged the abandonment of irrigation in these cases. Drainage suffices.

The second indication, after drainage, is to remove the focus of infection, or to close the perforation in the alimentary canal. Moty discountenances efforts to remove the appendix or to close a perforation unless it can be done with comparative rapidity and ease. Rapidity and ease of operation often depend as much upon the skill of the operator as upon the state of the patient's abdomen; and while we admit the impropriety of prolonged investigation, with eventration of the intestines, and other manipulations which produce marked shock, we do not approve of the fashion which is now developing in some cliniques, of leaving the appendix in the abdomen in practically every case of suppurative appendicitis; nor can we at all subscribe to the dictum that drainage alone will suffice in cases of gastric and intestinal perforation. The exceptional cases thus treated, which are attended by recovery, are merely examples of the reparative power of nature even under the most adverse circumstances, and by no means prove to our satisfaction that recovery would not have been more sure and rapid if the perforation had been sutured at first.

The third indication concerns the elimination of the toxins and the drainage of the abdomen. Moty acknowledges the inestimable value of the continuous proctoclysis popularized by Murphy, and suggests that every case in which there is a peritoneal exudate does not necessarily require drainage. This is a point on which mature judgment sometimes goes astray, and the maxim "drain when in doubt" is one of the soundest in surgery.

The fourth indication is to exclude uninfected portions of the abdomen from contamination. This is accomplished during the operation by the use of gauze tampons, and further aided during the after-treatment by the head-high position introduced by Fowler.

It is the uniform adoption of these methods, based on definite principles, which has enabled Murphy to reduce his mortality to such an exceedingly low point; and the everyday experience of surgeons the world over, who follow his plan with scrupulousness and intelligence, only serves to confirm its value.

Murphy[2] has described at some length the application of continuous proctoclysis in cases of peritonitis. *Fig.* 71 shows the simplest form of apparatus, and that which is probably the most satisfactory. The hard rubber nozzle, which is provided with numerous openings, and which is inserted just within the anus, is bent so as not to press against the posterior rectal wall, when the patient is sitting up in bed. The tube is bound to the patient's thigh by an adhesive strip, so as not to be displaced; and the reservoir is never placed higher than 15 in. above the nozzle —usually 5 in. is high enough. When once placed, the rectal tube need not be removed for several days. If the solution (1 dr. each of sodium chloride and calcium chloride to the pint of water) is expelled by the patient, the reservoir is lowered, and the flatus is then expelled along the tube into the reservoir, and the solution dribbles into the rectum as the latter ceases to contract. It is customary to attempt to keep the solution hot by surrounding it with bags of hot water; but in our own minds it is very doubtful whether this has any effect on the temperature of the solution after it has flowed through the tube to the rectum. Murphy says the amount of saline administered in this way averages 18 pints in twenty-four hours; he thinks a quantity less than 8 pints of little value. He has a pint and a half of the solution placed in the container every two hours; this all flows into the rectum in forty or sixty minutes; then the rectum is at rest for an hour before a new quantity is introduced, the tube remaining in the anus all the time.

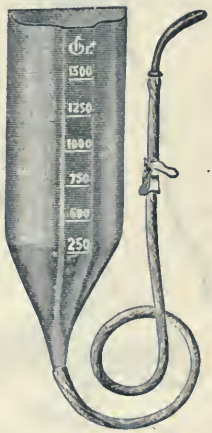


Fig. 71.—Proctoclysis apparatus consisting of fountain syringe, large rubber tube and vagina, hard rubber or glass tip.

[Dr. H. B. Paterson, London, has introduced a modified irrigator having the douche can fitted with an electric heater which connects with any suitable electric supply by a cord and wall plug (*Fig.* 72). If the can be filled with fluid at 106° F., Paterson says he has ascertained by experiment that the saline enters the rectum at a constant temperature of 99° to 100° F., and he thinks this point important.]

Abscess, Subphrenic.—Several papers on this subject have appeared during the past year, of which the most important is that by Piquand,[3] who has collected 890 cases, compared with the 252 collected in 1899 by Finkelstein; this shows that it can no longer be considered a rare affection. Those surgeons who have not seen cases probably have overlooked them. Piquand finds that it occurs on the average once among every 900 patients treated in hospital. Only 25 patients were less than 15 years old; the majority were from 20 to 40 years. In infants subphrenic abscesses are usually tuberculous in origin.

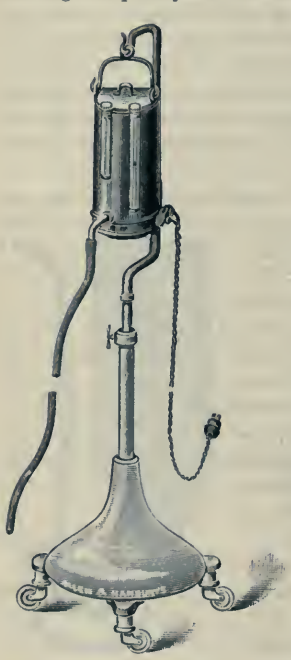


Fig. 72.—Paterson's Irrigator fitted with electric heater.

The principal groups of causes are as follows: Gastric, 251 cases (28 per cent); intestinal, 56 (6·3 per cent); appendicitis, 191 (21 per cent); liver and biliary disease, 136 (15 per cent); other affections (lesions of spleen, pancreas, kidneys, female genitals, thoracic organs; tuberculous lesions, traumatisms, and unknown causes) make up the remainder—about 30 per cent. As regards site, 343 (36 per cent) of the abscesses were between the right lobe of the liver and the diaphragm, in front of the coronary ligament; next most frequent are the left anterior abscesses—300 (about 33 per cent). The former are more frequent because they follow appendicitis, and hepatic and biliary as well as gastric lesions; the left anterior abscesses are mostly caused by gastric lesions.

Symptoms.—These may be divided into those of the preceding disease (gastric ulcer, appendicitis) and those of the abscess itself. The difficulty of diagnosis depends on the insidious way in which the abscess usually develops. As a rule, these abscesses conform to one of three types: (1) Those developing in an antero-inferior (abdominal) direction; (2) Those developing upwards and causing distinctly diaphragmatic and pulmonary symptoms; (3) Retroperitoneal abscesses tending to point in the loin. The *diagnosis* depends on

discovering a probable cause in a preceding illness, and in recognizing the local signs (abdominal and thoracic) and the constitutional symptoms of suppuration.

TREATMENT.—Piquand considers in detail the operative approach by (1) laparotomy, (2) subpleural thoracotomy, (3) the transpleural and transdiaphragmatic route. In opening an abscess pointing down and forward, he follows the teaching of Lejars, to open directly into the abscess cavity, without traversing the healthy peritoneum; but this method has the disadvantage that often it is impossible to determine beforehand the exact limits of the adhesions, and that the surgeon is uncertain whether he may not have ruptured the adhesions at another portion of the abscess wall, and thus unwittingly have contaminated the peritoneum. It seems safer to us, in approaching these low-lying subphrenic abscesses, to open first the healthy peritoneum, and adjust a coffer dam of gauze all around the suspicious area. Then the adhesions may be ruptured with safety, and the abscess be properly evacuated and drained. This is the more important, since it is perfectly proper, as urged by Piquand, for the surgeon to explore the interior of the abscess cavity, and look for pockets of pus not effectually drained by the first incision.

If the cause of the abscess is found to be a gastric or duodenal perforation, Piquand advises no attempt at suture. This is probably sound advice; almost all such attempts have been unsuccessful.

He finds that the abdominal route has been employed in 214 cases, with a mortality of 36 per cent; the lumbar route in 47 cases, with a mortality of 23 per cent; and the transpleuro-diaphragmatic route in 201 cases, with a death-rate of 33 per cent. Although the mortality following operation is high (averaging 30 per cent), yet as about 92 per cent of patients not operated on succumb, there is no question as to the proper course to pursue.

Other articles on subphrenic abscess during the year are those by Guibal,[4] who dwells particularly upon the physical diagnosis; Meisel,[5] who studies left-sided subphrenic abscesses; and Lance.[6]

Pneumococcal Peritonitis.—Carmichael[7] has had an experience of 20 cases. He finds that it is much more frequent in children, forming from 5 to 10 per cent of all cases of general peritonitis in a children's hospital. Of his 20 cases, 8 were in boys and 12 in girls. Recently he has seen 4 or 5 cases a year, mostly during the summer months. An epidemic is not unusual, 3 of his cases occurring in one week, and 2 others on consecutive days. Infection by the Fallopian tubes is rare, no evidence of it existing in any of his patients; in 6 cases there was a definite lesion in the lungs, but if infection occurred by way of the blood-stream, one would expect peritonitis to be a much more frequent complication of pneumonia than it is, as the pneumococci are usually present in the circulating blood (Ewing). He thinks direct infection from the intestinal tract is much the most frequent cause. Jensen has produced pneumococcic peritonitis by feeding rabbits and mice with these organisms. The early symptoms are

those of a very severe gastro-enteritis. The diagnosis is made chiefly by recognizing the presence of diffuse peritonitis, but excluding the appendix as the cause. The prognosis is bad, 35 per cent of this series of 20 cases dying.

REFERENCES.—[1]*Sem. Méd.* Feb. 10, 1909; [2]*Jour. Amer. Med. Assoc.* Apr. 17, 1909; [3]*Rev. de Chir.* Jan. Feb. Apr. May, Aug. Sept. 1909; [4]*Ibid.* Jan. and Mar. 1909; [5]*Münch. med. Woch.* July 13, 1909; [6]*Gaz. d. Hôp.* 1908, No. 60, in *Il Policl.* Sept. 20, 1908; [7]*Brit. Med. Jour.* Sept. 18, 1909.

PERITONITIS, TUBERCULOUS. *Robt. Hutchison, M.D.*

Wilcox[1] speaks highly of the value of inunction of **Iodoform Oil.** He uses the following formula:—

℞ Iodoform ℥ij | Olive or Cod-liver Oil ad ℥viij
Ether ℥iiss |

REFERENCE.—[1]*Med. Rec.* May 2, 1908.

PERTUSSIS. *Prof. G. F. Still, M.D., F.R.C.P.*

There are few diseases more dangerous to life in early infancy than whooping-cough. Statistics from New York[1] showed that in 1905 there were more deaths from whooping-cough in children under five years of age than from scarlet fever and typhoid combined; and yet, while provision is made for the hospital accommodation of the latter diseases, there is no such accommodation for whooping-cough in that city. It is recommended that hospital care should be provided specially for whooping-cough in every city. Donnally states, that in 1906 in the United States, of the specific diseases, only typhoid and diphtheria showed a higher mortality than whooping-cough. About 20 per cent of cases of this disease occur in infants under one year of age, and the infection has even been contracted within the first week of life. A bacillus described by Bordet and Gengou seems to have some claims to specificity; it resembles in some parts, but not in all, the influenza bacillus, and has produced a barking cough in monkeys and dogs inoculated with it. The infection seems to be definitely conveyed by formites; for instance, Donnally quotes from Ruhran the case of some children having whooping-cough on board a ship which touched at St. Helena; their clothes were sent ashore to be washed, and the washerwoman's children contracted whooping-cough, although there was none on the island at the time. During the early stage of the disease a blood-change is often noticeable, the leucocytes being increased, with some lymphocytosis.

DIAGNOSIS.—Donnally considers the following points as of value: The greater severity of the cough at night; its increasing severity; the absence from throat and chest of physical signs to account for the cough; the presence of a lymphocytosis; a pale urine, strongly acid, of high specific gravity, with increased amount of uric acid; the failure of the usual cough sedatives and antispasmodics.

PROGNOSIS.—The chief danger of whooping-cough is its complications, particularly bronchopneumonia; but the age of the patient is the most important point in prognosis. From 25 to 30 per cent of

cases occurring in the first year of life are fatal, and of the fatal cases 57 per cent were under the age of one year.

TREATMENT.—Donnally recommends **Fresh Air** as much as possible, for an appreciable reduction in the number and severity of the paroxyms occurs when the child is in the open air. If the weather is too inclement to allow of widely-open windows and outdoor life, alternate use of two rooms should be advised, with thorough airing or formaldehyde fumigation of the unused room in the interval. If there is much vomiting, the child should be fed just after a paroxysm as far as practicable. The belt recommended by Kilmer has proved useful; it is an abdominal belt, made of linen, with a strip of elastic webbing under each arm, and laced up the back. Its employment in 558 cases was followed by improvement in 87 per cent. It is said not only to relieve the vomiting but also to diminish the paroxysms. (*See Medical Annual*, 1909, p. 639).

Masland[2] recommends **Inhalation of Quinine.** Thirty grains of the alkaloid quinine are dissolved in one ounce of the following mixture:—

℞ Potassium Hydrate ʒj | Alcohol ad ʒiss

Of this add one and a half drachms to

℞ Oleic Acid ʒiij | Liquid Petrolatum ʒiss

The quinine, dissolved in one ounce of the solution thus made, is sprayed by a "nebulizer" directly into the nostrils, not less than three times daily. The chief difficulty in treatment with this spray is, so Masland states, that after the first week the child is so much better that the mother begins to neglect the spray.

Butler[3] recommends in the early stage of whooping-cough **Anemonin** in doses of $\frac{1}{134}$ gr.; he does not state how frequently it is to be used. He knows no one remedy which relieves whooping-cough so well as **Iodized Calcium** or **Calcidin,** of which ½ to 2 gr. may be given every three hours. **Atropine** he thinks specially useful in doses of $\frac{1}{300}$ to $\frac{1}{250}$ gr., or **Hyoscine** may be substituted. **Duboisine,** he says, is also excellent in small doses, and promptly relieves the cough; but it answers better in summer than in winter. It may be doubted whether these powerful drugs, which must be used in such small and accurately measured doses, are particularly suitable for the treatment of children. The same writer recommends the vapo-cresoline lamp, as loosening the severity of night paroxysms of whooping-cough in some cases.

Fluoroform is a substance analogous to chloroform, and is sold as an aqueous solution of the gas, containing 2·8 per cent by volume; the dose is 5 to 10 grams daily; it is stated by some to give better results than bromoform. It is said to be non-toxic, but as has been pointed out,[4] this may well be, if, as some observations suggest, there is no fluoroform in the solution, but merely ordinary air, a result, it is stated, of technical difficulties in manufacture.

Inhalation of Oxygen is recommended by Weill[5] as not only diminishing the violence of the paroxysms, but also having some prophylactic value against the supervention of bronchopneumonia.

The oxygen must be used liberally, and if there is any suspicion of bronchopneumonia, the inhalation should be continuous. Weill had previously used antipyrin, but this drug he considers useless in the more severe cases of whooping-cough.

A new drug for this disease is **Eulatin,**[6] which is given in doses of ·1 to ·5 gram every three or four hours, either as a powder or in emulsion: it is said to reduce the frequency and intensity of the paroxysms; it would seem to be a combination of bromide with coal-tar derivatives.

Fleming[7] reports good results from the use of a **Vaccine** prepared from the organisms isolated by Bordet and Gengou; the success of this vaccine he considers proof of the specificity of the micro-organism.

In cases with convulsions complicating whooping-cough, Eckert[8] has used **Lumbar Puncture** with success; in some cases it was necessary to repeat it; and its action was assisted by rectal administration of chloral hydrate; the children were also treated with douches after the lumbar puncture.

Subcutaneous Injections of Morphia have been recommended by Triboulet and Boyé, ¼ cgram for infants under one year, and double this quantity for those over this age. These doses made the children drowsy for a little while, but effectually controlled the frequency and severity of the cough. The dose is given once daily for three days, and then omitted for three days, when it may be repeated if the attacks increase.

REFERENCES.—[1]*Arch. of Pediatr.* Oct. 1908, p. 785; [2]*Jour. Amer. Med. Assoc.* Sept. 1909; [3]*Canad. Jour. Med. and Surg.* Aug. 1909, p. 99; [4]*Jour. Amer. Med. Assoc.* July 17, 1909; [5]*Sem. Méd.* Sept. 8, 1909; [6]*Med. Klin.* 1908; [7]*Brit. Med. Jour.* July 7, 1909; [8]*Soc. de Pediatrie,* Oct. 1908, in *Brit. Jour. Child. Dis.* Dec. 1908.

PHAGEDÆNIC ULCER (Tropical). *J. W. W. Stephens, M.D.*

R. Ll. Paterson[1] describes epidemics of these ulcers occurring in Assam. Thousands of coolies were incapacitated during the tea-making season. The local name for the ulcers is "Naga sores." They commence generally as an itching papule, followed by vesicles, which on rupture have a base of grey false membrane. The ulcer grows steadily, attaining the size of a florin. It is circular and deep, and gives off a reddish fœtid exudation. The ulcerative process then becomes spontaneously arrested, and healing is complete in about six to eight weeks. Even if the ulcers are as big as the hand, they still remain circular, and though extending to the bone eventually heal. A gangrenous, sloughing type is rare. The commonest position is the front of the leg.

In ulcers that have been cleansed with antiseptics the author has found constantly a Gram-positive bacillus present in almost pure culture, and an absence of spirochætes or *Leishmania tropica.* [From the description given of them they would seem to resemble closely diphtheria-like bacilli which are commonly found in cancrum oris, noma, etc., in this country.—J. W. W. S.]

REFERENCE.—[1]*Ind. Med. Gaz.* Nov. 1908.

PHARYNGOSCOPY.

W. Milligan, M D.
D. Lindley Sewell, M.B.

The pharyngoscope recently invented by Harold Hays may be employed with advantage for the examination of the pharyngeal and nasopharyngeal cavities. The instrument (*Fig.* 73), mounted upon a handle through which wires from a rheostat pass, consists of a tube which carries the optical apparatus terminating in two small watertight electric lamps. The inner two-thirds of the horizontal shaft is enclosed in a metal sheath so arranged that its flat surface rests upon the dorsum of the tongue. The lens, which has a focal distance of one inch to one inch and a quarter, lies between and beyond the two lamps, while the eye-piece projects about three inches from the handle of the instrument. A small metal ball is fixed to the circumference of the eye-piece to indicate when rotated the direction in which the lens is moving.

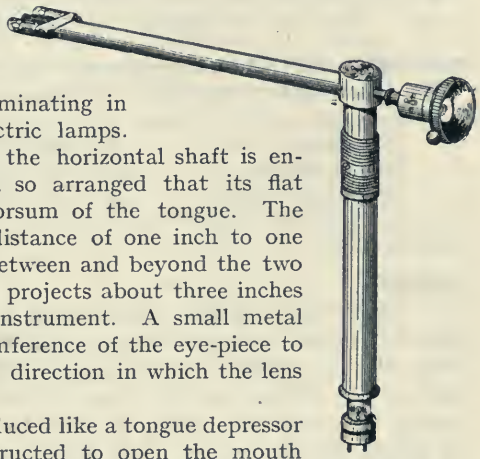


Fig. 73.
Hays' Pharyngoscope

The instrument is introduced like a tongue depressor —the patient being instructed to open the mouth and to breathe regularly and deeply in order to keep the muscles relaxed—until the end containing the lens is about one-sixteenth of an inch from the post-pharyngea.

Fig. 74.—First position in inserting the instrument.

Fig. 75.—Pharyngoscope in place with mouth closed.

wall (*Fig.* 74). When once in position the patient is instructed to close the mouth and to breathe deeply through the nose (*Fig.* 75).

When the lens points upwards, as is indicated by the ball upon the outer end of the instrument, a view of the vault of the nasopharynx is obtained. By slightly depressing the handle, the posterior nares with the posterior ends of the middle and superior turbinals come into view. By slight rotation of the lens the lateral wall of the nasopharynx, with the orifice of the Eustachian tube and the fossa of Rosenmüller, appear. A full view of the area under inspection is possible at one time.

PITYRIASIS CAPITIS (Dandruff). *E. Graham Little, M.D., F.R.C.P.*

The following formula[1] appears likely to be useful :—

℞	Resorcini	ʒj	Tinct. Capsici	ʒj
	β-naphthol.	ʒss	Ol. Ricini	ʒj
	Chloral. Hydr.	ʒij	Spt. Odorati	ʒiv
	Tinct. Cantharidis	ʒiv	Spt. Myrciæ	ad Oj

M. et Sig.: Rub into scalp daily. Shake before using.

Reference.—[1]*Ther. Gaz.*

PLAGUE. *J. W. W. Stephens, M.D.*

G. Lamb[1] sums up the present state of our knowledge regarding plague: (1) The disease in man is entirely dependent on the disease in the rat. (2) The disease is conveyed from rat to man solely by the rat-flea. (3) Plague in man is not in itself infectious. (4) Plague is usually conveyed from place to place by imported rat-fleas carried by people on their persons or on their baggage, the human agent not infrequently himself escaping infection.

W. Glen Liston[2] discusses the prophylaxis of plague in India. The methods include: (1) Systematic rat-trapping. The number of traps must amount to 2 per cent of the population. The habits of the rat must be carefully studied, and the carrying out of operations must be very thorough. (2) Disinfection of clothing and kit of travellers. This is an important measure. Infection is carried from rats of one place to those of another by human agency by means of fleas which have left sickly rats, and are then carried to new localities on their temporary human hosts.

N. H. Choksy[3] states that *septicæmia in plague* is difficult to recognize, but that a thready, compressible, or imperceptible pulse, accompanied by great nervous prostration, jaundice, and rapid wasting of the face, is very suggestive. Anti-plague serum gives the only hope of recovery.

A. Buchanan[4] urges the keeping of cats as the most ready means of extirpating plague. Cats in India breed twice a year, and have about three kittens each time.

J. S. Purdy[5] discusses the early diagnosis of plague. The existence of fever, a swelling in the right groin with enlargement of a femoral gland, should arouse suspicion. If in addition there is lassitude, frontal headache, vomiting, aching of the limbs, vertigo, drowsiness, with intervals of wakefulness, *absence of rigors*, drawn and haggard features, pupils dilated, anorexia, rise of temperature to 102°–103° F., acceleration of pulse and respiration, a skin dry and burning, tongue with a creamy fur which rapidly dries and becomes brown, intense thirst, and

extreme prostration. In 70 per cent of cases this is the typical appearance. It is important also to examine the epitrochlear glands, as in syphilis these are nearly always enlarged, but rarely so in plague.

Septicæmic Plague.—Here there is no special glandular enlargement during life. The course of the disease is rapid, the patient prostrated, although the temperature may not rise above 101° F., and hæmorrhages are frequent.

Pneumonic Plague.—The sputum is profuse and watery. There are cough, hurried breathing, delirium, the patient dying on the fourth day. A microscopic examination of the fæces is most important.

Pestis Minor.—Such cases only arouse suspicion when there is possibility of plague being endemic or having been introduced.

R. P. Strong,[6] in a general article on the methods of combating tropical diseases, states that as regards plague, besides an active campaign against rats, by far the most effective method consists in inoculating all the people living in badly infested districts. The results have been beyond expectation. It is believed also that a method of vaccination has been obtained which will reduce the mortality in the vaccinated to 20 per cent, while the usual mortality is about 80 per cent.

REFERENCES.—[1]*Ind. Med. Gaz.* Mar. 1909; [2]*Ibid.*; [3]*Ibid.*; [4]*Ibid.*; [5]*Austral. Med. Gaz.* Aug. 20, 1908; [6]*Jour. Amer. Med. Assoc.* Feb. 13, 1909.

PLEURISY. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Diagnosis of Pleural Effusion.—The "paravertebral triangle" as a sign of pleural effusion was first brought into notice by Grocco, and usually goes by his name. The sign consists of an area of partial dullness of triangular shape on the healthy side opposite to the pleural effusion. Its base, 2 to 5 cm. in length, lies horizontally about the level of the 12th rib; its inner side corresponds with the line of the vertebral spines; its outer boundary is formed by the line connecting the extremity of the base with the top of the inner vertebral border. This latter point is said to vary with the height of the fluid, but Moorhead[1] has never observed it to lie above the level of the 4th dorsal spine, even when the effusion filled the chest, an important point, in the light of Keith's researches referred to later. The existence of the triangle is confirmed by the X rays, which show an area of shadow in this position. Two considerations arise, its existence being accepted: (1) Is it present only in pleural effusion, in which case it would be of great value in discriminating fluid from thickened pleura or pneumonic lung? and (2) To what is the sign due?

1. Moorhead, who has reviewed the opinion of the leading authorities who have investigated the triangle, is able to say that at present there is a general consensus as to its presence in effusion and absence in other conditions, though Ewart[2] has demonstrated the presence of a somewhat similar area, but with a broader base, in cases of ascites. As Ewart remarks, a dullness which disappears on lying on one side and reappears on lying on the other side, is not likely to be due to bones or muscle, or to pneumonic consolidation or tumour. Though not

present in all cases of pleural effusion (14 out of 19), it is a sign of great value (Moorhead).

2. Two theories have been invoked to explain this triangle of dullness: one that the effusion exerts a dampening effect and prevents the vertebral column from conducting the resonance of the sound side; the other that the weight of the fluid displaces the mediastinum and causes a slight collapse of the healthy lung. Such mediastinal displacement can be proved to be possible by injection on the cadaver; and recently Keith has described a large left pleural effusion in a stillborn child, the mediastinum being found bulging to the right so as to compress the base of the right lung. This is rendered possible by the posterior mediastinal mesentery described by Keith, a fold of pleura extending from the back of the pericardium to the spine, with a front-to-back extent of one to two inches, and allowing a pendulum-swing to the contents of the thorax, to use Professor Elliot Smith's expression.

It is to be noted that this so-called mesentery extends upward only to the level of the 4th dorsal spine.

Injection of Air in Pleural Effusion.—The injection of air into the pleura, while at the same time fluid is being withdrawn, was first suggested by Potain for cases of hydropneumothorax with the idea of preventing the re-opening of the fistula into the lung. Such conditions are, however, comparatively rare, and the method has been extended to the evacuation of ordinary effusions (*vide Annual*, 1909). The advantages claimed are that it makes it possible to completely remove very large effusions without any of the inconveniences or dangers—dyspnœa, acute œdema of the lung—which are otherwise apt to ensue, and that the pressure of the air or gas in the pleura tends to prevent re-collection. Some very striking instances are given in which repeated tapping had been necessary, but return of the effusion ceased as soon as this method was adopted. Even as regards mere weight, the comfort of the patient is greatly enhanced by the substitution of gas for liquid. In hæmorrhagic effusions the pressure of the gas is said to prevent the transudation of blood.

Oxygen was first tried in place of air, in the hope that it would act as an antiseptic; but the advantage of the presence of gas in the pleura is really mechanical, and in consequence oxygen has been abandoned, and in its place sterilized air or nitrogen is used on account of the slower rate of absorption. The air may be sterilized by being filtered through cotton-wool placed in a tube fastened to or leading into the tube of the aspirator. Through such a filter the air may either be pumped into the thorax or allowed to be sucked in by the inspiratory movements themselves.

Achard[3] dispenses with the special tube and filter, pumps the air direct into the vacuum bottle of the aspirator, and allows it to enter the thorax by way of the tube through which the fluid is running out. This idea is founded on Pasteur's observation that air passing through a moistened tube becomes sterile. He has never seen sepsis arise. The air should be introduced at intervals alternating with the with-

drawal of the fluid. The amount must vary in each individual case, Achard at first injected about half as much air as he withdrew fluid; latterly his practice has been to employ a larger volume of air, but in no case must the amount be greater than the fluid, or feelings of oppression, dyspnœa, and even subcutaneous emphysema may result.

Hæmorrhagic Effusion.—Bradshaw[4] mentions two cases in which an effusion consisting of almost pure blood was present in the pleura, and in both without any exceptionally serious import. In one case the blood was thought to come from the rupture of pleural adhesions, in the other to have its origin in some blood condition allied to the hæmorrhagic diathesis, as the patient suffered later from a painful anasarca of the lower extremities, with a recurring purpuric eruption. At three tappings in seventeen days 107 oz. of practically pure bood were withdrawn in the latter case. A good recovery followed.

The Prevention of Pleural Adhesions.—O. Grünbaum and Pitt[5] have sought, by the injection of liquid paraffin, to prevent the formation of adhesions as a result of pleurisy. The method was proved by experiment on guinea-pigs to be free from danger, and it is encouraging to note that the paraffin was found to have formed a layer coating the lung. Their method has been tried in five actual cases of pleural effusion, and in all without any untoward symptom. After drawing off the liquid through a stout needle attached to four feet of rubber tubing, the patient was told to breathe out slowly. At this moment the rubber tube was detached, a syringe containing 20 ccm. of sterile paraffin screwed on, and the liquid slowly injected.

References.—[1]*Dublin Med. Jour.* June, 1909; [2]*Lancet*, June 19, 1909; [3]*Sem. Méd.* Sept. 16, 1908; [4]*Brit. Med. Jour.* May 15, 1909; [5]*Brit. Med. Jour.* Oct. 10, 1908.

PNEUMOCOCCUS INVASION OF THE PHARYNX.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

J. Elliott[1] describes cases of pneumococcal invasion of the pharyngeal mucosa characterized by uniform redness and swelling, and by marked enlargement of the cervical lymphatic glands. Inoculations made from swabs taken from the throat showed pure cultures of the pneumococcus.

Sir Felix Semon[2] refers to two cases of pneumococcus invasion of the throat characterized by profound asthenia, ulceration of the affected parts, an almost entirely afebrile course, and by complete absence of enlarged cervical lymphatic glands. In the first case, pneumococci were present in almost pure culture; in the second, the culture consisted mainly of pneumococci. In both cases, towards the end a punched-out loss of substance occurred, whilst by far the greater part of the ulcers healed without leaving any scarring behind.

In a case recently seen by the writer, a young lady aged 21, a pure cultivation of the pneumococcus was obtained upon two separate occasions. The attacks of sore throat were frequent, and were characterized by great pain and prostration, a moderate degree of temperature, but by an absence of glandular enlargement.

References.—[1]*Brit. Med. Jour.* June 26, 1909; [2]*Ibid.*

PNEUMOKONIOSIS. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Gulland,[1] being asked to give evidence before a Home Office Committee on the subject of stonemasons' phthisis, took occasion to review afresh the part which tubercle plays in its causation and continuance. He took as his material the cases of 87 masons, 76 of whom were hewers and 11 builders, who had attended the out-patient department of the Royal Victoria Hospital, Edinburgh, during the last four years. The preponderance of hewers, i.e., men who cut the stone, is evidence of the danger of the occupation. His first conclusion is an interesting one: that he has never succeeded in satisfying himself that there is any fundamental distinction in *physical signs* between stonemasons' phthisis and ordinary tubercular phthisis. The sputum was examined in 54 of these cases (one examination in each case), and tubercle bacilli were present in 48, a percentage quite as high probably as in a similar number of cases of ordinary phthisis taken at random and submitted to a single examination. He concludes from this that practically all these cases are tuberculous; the tubercle bacillus, he thinks, comes into play very early in the condition, and the irritation of the dust gives the disease its chronic type from the formation of fibrous tissue set up. The dust he looks upon as an irritant facilitating the lodgement of the tubercle bacillus.

REFERENCE.—[1]*Edin. Med. Jour.* Mar. 1909.

PNEUMONIA. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

The use of a **Vaccine** constitutes the chief advance during the year in the treatment of pneumonia, and Wilcox[1] and Butler Harris[2] report encouraging results. (*See* TREATMENT BY BACTERIAL VACCINES, page 87).

Norris[3] calls attention to the merits of **Fresh Air** in the treatment of pneumonia. In the Philadelphia General Hospital the pneumonia patients are isolated in a special ward, the windows of which are constantly kept wide open, whatever the weather or temperature. The comfort of the patients is much increased where this is done, as contrasted with treatment in an ordinary ward; dyspnœa is lessened, and, Norris firmly believes, arguing from a basis of some hundreds of cases, the mortality is diminished. No deleterious effects have been observed.

Rowntree[4] calls attention once more to the marked retention of chlorides which occurs in lobar pneumonia before the crisis, the excretion being greatly increased immediately after the fall of temperature. The increase, however, may precede the fall, and is often the first sign of improvement. Of the cause of this retention he considers we are still in ignorance. Working at influenzal pneumonia, he found that the decrease, though present to some extent, was not nearly so marked as in the true croupous disease.

McCrae[5] discusses the physical signs present when *empyema* supervenes on pneumonia. From a series of cases he concludes that these are not as a rule what are usually expected. No special feature,

such as a rigor, marks the advent of the empyema, the symptoms due to which are but a continuation of the original illness, the temperature as a rule never falling to normal, or, if so, but for a few hours. The fever persists, and takes on a rather irregular type: in his cases this was the only constant symptom. The physical signs are variable: the percussion note, dull already, may take on a more intense character; the vocal fremitus is often well kept; the breathing, though often diminished or lost, may still be heard, tubular in quality and accompanied by râles. Most help is to be derived from the character of the vocal resonance, which takes on a curious nasal quality. From his paper, the differential diagnosis between empyema and delayed resolution is evidently very great. The physical signs are often inconclusive or misleading, and the lesson he draws is the importance of the repeated use of the needle in all doubtful cases.

REFERENCES.—[1]*Lancet*, Aug. 14, 1909; [2]*Brit. Med. Jour.* June 26, 1909; [3]*Amer. Jour. Med. Sci.* Nov. 1908; [4]*Johns Hop. Hosp. Bull.* Dec. 1908; [5]*Montr. Med. Jour.* July, 1909.

PNEUMOTHORAX. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Spontaneous pneumothorax, or pneumothorax in those apparently healthy, forms the subject of a paper by Hamilton,[1] who has met with seven instances of this rare and interesting condition—interesting because of the doubt as to its etiology, whether due to the rupture of an emphysematous bleb or to latent tuberculosis.

Hamilton will not allow that the former explanation can be applied to all the cases: emphysema of any degree is often not demonstrable, and the accident often occurs during rest or sleep, when no special strain is being put on the lung. On the other hand, in these cases no proof or sign of tuberculosis can be made out; there is no fever, and no effusion follows.

In one case of this series tuberculosis made itself manifest some years later, but the others have all remained in excellent health up to six or even ten years later. It is important to remember that there is a group of cases of pneumothorax in which, though their origin is obscure at the time, the prognosis is good.

REFERENCE.—[1]*Montr. Med. Jour.* July, 1909.

POLYPI, NASAL. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

J. S. Fraser,[1] in discussing the question of the formation of nasal polypi, remarks that in early cases of rhinitis there is an excessive amount of vascular turgescence associated with a slight degree of œdematous infiltration. Should the inflammation become chronic, the œdema increases on account of changes in the walls of the blood-vessels and blood-spaces. He believes that in most cases the polypus is broad-based, and attached along the lower border or outer surface of the turbinated body, and that the pear-shaped appearance so frequently spoken of is due to the action of the loop of the snare used for extraction purposes. He regards changes in the ethmoid bone

as the *effect* and not the *cause* of nasal polypi. *Plate XLII* depicts the early microscopic changes in the production of nasal polypi.

Naso-antral Polypus.—H. Brown Kelly[2] calls attention to the pathology of naso-antral polypus first described by Killian in 1906. Of fifteen cases of naso-antral polypus, ten were under 20 years of age. Seven were males and eight were females. Two main symptoms, viz., snoring and thick speech, were as a rule complained of. In some of the cases a free flow of a watery discharge was present. In nine cases—in eight the antrum was subsequently opened—the trans-illumination test was tried, and the cavity illuminated well in all. In the eight cases where transillumination was good and the antrum was subsequently opened, a cyst was found occupying the cavity in seven. In all of these, with one exception, transillumination upon the affected side was equal to or better than that on the non-affected side.

A naso-antral polypus may at times be removed through the nose by careful traction with a wire snare, although this is difficult and somewhat uncertain, or it may be removed by opening the antrum, determining its exact attachment, and removing it completely with its nasal prolongation. Whether or not the whole of the mucosa lining the antral cavity should be removed or not is still an open and debatable question.

REFERENCES.—[1]*Jour. of Laryngol.* Aug. 1908; [2]*Lancet*, Jan. 9, 1909.

PROSTATE, DISEASES OF. *E. Hurry Fenwick, F.R.C.S.*

Rectal Finding in Carcinoma.—Freyer[1] gives the result of his tactile experiences in detecting carcinoma of the prostate after eight and a half years' appreciation of the texture of the enlarged prostate, verified by subsequent prostatectomy. The first feature that will strike you, he says, on rectal examination in cases of cancerous enlargement of the prostate, which is almost invariably of the scirrhous type, is its intense hardness, though occasionally we find soft, boggy patches, due to broken-down tissue. Then, the outline of the organ will be irregular, the lobes being ill-defined, and the median groove being partially or wholly obliterated. The organ will be nodular and ridged, with deep, irregular intervening furrows. Occasionally you will come across a case in which the carcinomatous prostate is smooth and globular, like an ivory ball. Most important of all for diagnostic purposes, the prostate will be immovably fixed in the pelvis owing to the invasion by the growth of the adjacent tissues. Bimanual examination will confirm the existence of these characteristics, particularly the immobility of the organ; but, as a rule, in cancer of the prostate no great prominence of the gland will be felt in the bladder, the growth invading the surrounding tissues rather than advancing into the bladder, the trigone of which is, however, very frequently involved. As additional aids to diagnosis, there will be enlargement of the glands in the groins in advanced stages of the malady; and at an earlier stage, small, hard, sago-like grains may be felt per rectum, covering the surface of the growth

PLATE XLII

CHRONIC INFLAMMATORY ŒDEMA OF THE SUBMUCOUS TISSUES OF THE NOSE

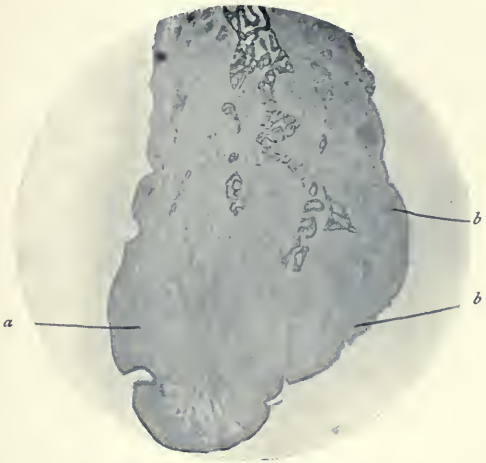


Fig. A.—Early chronic inflammatory œdema of the middle turbinal, or polypoid middle turbinal. (*a*) Note large connective-tissue spaces containing serum along the lower border of the turbinal. (*b*) The glands in this region are displaced inwards; the bone is healthy
× 6 diam.

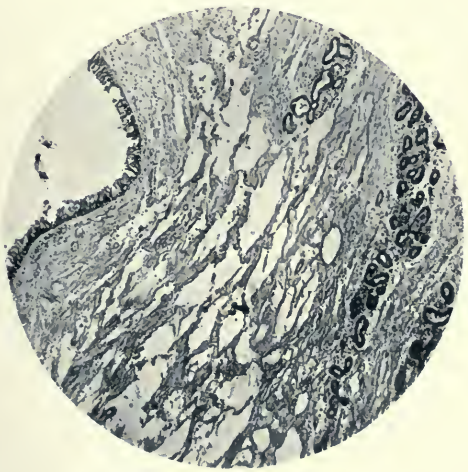


Fig. B.—Higher power view of same specimen as shown in *Fig. A.* Note glands pushed inwards by œdema of superficial layers
× 50 diam.

In both cases the microscopic section has been made in the coronal plane

Lent by Mr. J. S. Fraser

beneath the rectal mucous membrane. These are secondary deposits in the lymphatics coursing in the sheath of the prostate. Then, in the clinical history of the case you will have the rather sudden onset and rapid advance of the usual prostatic symptoms, the progressive and sometimes rapid loss of flesh, the feeling of lassitude, debility, and undue fatigue, the failure of appetite, the typical cachexia, and the pains in the loins, the sacral region, and lower limbs, due to pressure on the nerves by secondary deposits in the lymphatic glands, so characteristic of this disease.

Fig. 76.—Posterior aspect of the normal prostate, with the vasa not impeding the ureters.

The Sexual Power after Enucleation.—Papin[2] states that only one patient out of 52 who had undergone perineal prostatectomy preserved the normal ejaculatory power, but considers erectile power is better preserved after the operation. Thus, 12 were normal, in 16 the power was diminished, and in 24 it was abolished.

Fig. 77.—Posterior aspect of the enlarged prostate, with the vasa kinking and therefore dilating the ureters.

What is the cause of dilated ureters and back-pressure kidneys in some cases of enlargement of the prostate? Tandler and Zückerkandl,[3] of Vienna, have an instructive paper upon the kinking of the ureters by the vasa deferentia in hypertrophy of the middle lobe of the prostate. A comparison of the normal (*Fig.* 76) with the abnormal (*Fig.* 77) will show at a glance the value of the observation.

Notes on the Technique of Prostatectomy.—Ransohoff[4] mentions that he has found **Formaldehyde Gelatin** (glutol) of inestimable service in checking the hæmorrhage incidental to enucleation of the prostate. He voices the feeling of many when he remarks that there is, of course, one class of case in which the perineal operation is always indicated. This is the small, dense, fibrous prostate, adherent to the capsule, and in which a cystoscopic examination shows little or no intravesical projection. Here the careful dissection necessary to removal must be made with cutting instruments, and should, therefore, be controlled by the eye of the operator. In that very rare class of cases of prostatic hypertrophy in which there is concentric hypertrophy and contraction of the bladder, the perineal route is also to be preferred.

Perineal Drainage after Suprapubic Prostatectomy.—Several surgeons advocate the simultaneous drainage of the bladder by the perineum after removal of the prostate. Ransohoff (loc. cit.) has for the past eight months utilized the following expedient. After shelling out the prostate through an adequate suprapubic section, and after controlling hæmorrhage, he has, so far as possible, opened the perineum from the suprapubic incision by driving a large trocar and cannula through it. The trocar is pushed through the most dependent part of the emptied prostatic pouch against a finger of the left hand placed a little more than half an inch in front of the anus. By backward pressure, the finger of the right hand protects the rectum. This is easily done without changing the position of the patient. The bulb is avoided, and the membranous urethra undisturbed. The trocar being then withdrawn, the cannula projecting through the perineum, the largest self-retaining catheter, or a drainage tube, is pushed through the cannula from within. The cannula is then removed through the suprapubic opening by an affixed tape. The calibre of the cannula is that of a 36 (French) sound. After the cannula has been withdrawn, the drainage tube is placed with its upper end in the prostatic pouch, where it may be fixed by a perineal stitch.

Independently and coincidently, Lynn Thomas[5] has arrived at the same conclusion relative to the value of perineal drainage, but uses a perineal incision with a knife, and carries the drain tube through the emptied capsule of the prostate from the suprapubic incision out on to the perineal surface.

REFERENCES.—[1]*Lancet*, May, 1909, p. 1235; [2]*Sem. Méd.* Nov. 18, 1908; [3]*Berl. klin. Woch.* 1908, No. 47; [4]*Jour. Amer. Med. Assoc.* Sept. 1908; [5]*Brit. Med. Jour.* Oct. 1908.

PSORIASIS.

(*Vol.* 1909, *p.* 493)—Norman Walker recommends the application of an ointment consisting of chrysarobin ʒss. in vaseline ℥j. Its application may be preceded, in robust persons, by an alkaline bath; the alkali must, however, be thoroughly removed before the ointment is applied. It is to be rubbed in all over the body from the neck downwards, the face being protected by a linen mask; normal skin is to be so treated, as well as the morbid areas, until a general erythema is induced. During this treatment rest in bed is essential; when the course is complete, warm baths are permissible, and the disease should be cured.

PUERPERAL STATE, THE. *Victor Bonney, M.S., M.D., F.R.C.S.*

A "Rational" Puerperium.—Haultain,[1] in an article entitled "A Plea for a Rational Puerperium," remarks that the ordinary conduct of the puerperium more resembles that of the convalescence from a severe illness than that of the sequel of a normal function. He therefore adopted the following management: The puerpera, if willing, is encouraged to sit up in bed to meals on the second day. As early as she feels inclined to, she is allowed to leave her bed, walk to the fireside, and sit there for an hour. The fifth day, after rising, is practically spent out of bed. Of 100 patients so treated, 40 rose on the third, 35 on the fourth, and 25 on the fifth day for the first time. Only three of these patients developed a temperature of over 100° F. In two cases, slight retroversion was noted as present on the tenth day, and persisting at the end of six weeks. The women were uniformly eulogistic concerning the treatment adopted. Haultain gathers from this experiment that, where the woman desires to get up, and exhibits no ill results from her labour, she should certainly be allowed to do so. The return of the figure to the normal shape is much helped by early getting the abdominal muscles to contract, thus increasing the intraperitoneal tension, which after delivery is at a low ebb. The present-day management of the puerperium leaves the abdominal wall in a condition of forced laxity for ten days or more, and reliance is solely placed on the binder to support the figure.

As regards the complications of the puerperium, early rising, so far from being provocative, is entirely preventive. The sitting or standing posture permits of more free drainage from the genital canal, and sepsis is thus rendered less likely, whilst in respect of involution this author believes that the increased tone of the abdominal wall is distinctly helpful. Further, any tendency to retroversion is much lessened, because, in the sitting or upright positions, the uterus tends to fall forwards, and the backward traction on the broad ligaments, which obviously occurs in recumbency, is done away with.

The occurrence of thrombosis and pulmonary embolism is rendered less likely, if steps are early taken to stimulate the circulation by early rising, whilst the improved muscular tone minimizes the natural tendency to constipation, due to the reduction of intraperitoneal pressure that follows labour. The practice of "confinement" after labour is probably derived from ancient sacerdotal customs introduced at a period when priests assigned to themselves the position of obstetrical specialists, and has lasted, in spite of all rational considerations, down to the present day.

This paper of Haultain's is a very important one. There can be little doubt in the minds of all advanced practitioners of the obstetric arts that the habit of invaliding normal women after normal labour has been, and is, a bad one. Moreover, its practice has deeply rooted in their minds the belief that, whether they feel ill or not, they are in fact invalids. This is a belief which it will take many years of education to eradicate. At present it is so firmly fixed, that many

a practitioner, wishful to get his patient up within the first week, yet feels diffident of doing so lest, in the event of any untoward symptoms subsequently arising, his management of the puerperium may be held responsible for them.

Puerperal Sepsis.—A. Lea and Sidebottom[2] have made a series of observations on the bacteriology of the puerperal uterus. Under normal circumstances, they only found its cavity sterile in 20 per cent of the cases. The organism most commonly found was the staphylococcus, but streptococci were also often present. Of the staphylococci, the white variety was observed most frequently. The authors point out that the frequency with which they found organisms in the uterus is greater than that of any other workers, but they add that the method adopted by them of obtaining the uterine secretion allowed of the possibility of it being contaminated with the discharges from the cervix.

Nicholson and Evans[3] have made a similar study, but used a tube specially constructed to secure the obtaining of a sample of the contents of the uterus, uncontaminated by cervical discharge. They found the uterus sterile at all periods during the normal puerperium following normal labour. The most important of their general conclusions are as follows: (1) The uterine lochia is sterile in the uterus in normal cases, throughout the puerperium. (2) Streptococci are never present in the cavity of the uterus without causing symptoms. (3) In a few instances, non-pathogenic germs may be found in the uterus after instrumental or manipulative delivery. (4) The ascent of the gonococcus is a rare event.

This paper is very interesting. It supports the results obtained by Victor Bonney and Foulerton from an investigation carried out some years ago, in which similar precautions were taken to procure an uncontaminated sample of the contents of the uterine body. Foulerton and myself (V. B.) then pointed out that the frequency with which certain Continental observers had found organisms in the normal puerperal uterus was probably attributable to the faulty method of obtaining a sample of its contents, and we took special precautions to avoid this error of technique. The withdrawal of the lochia from the uterus by a syringe attached to the end of a curved glass tube that has been passed through the cervical canal is most likely to result in a contaminated specimen, and the method subsequently of plating out this "shake culture" employed by Lea and Sidebottom renders the detection of contamination colonies impossible. Our own technique, besides a special cap over the top of the tube to minimize the chances of cervical contamination, included the cutting up with sterilized scissors of the swab used to collect the uterine contents, and the separate culture of each fragment so obtained, and unless the organism was isolated from each piece its presence was held to be probably due to contamination, for the cervical canal, as was then pointed out, usually contains bacteria. The acceptance of the statement made by Lea and Sidebottom, that the normal puerperal

uterus frequently contains streptococci, would be a matter of such far-reaching importance that it could only be granted if the reliability of the methods employed in arriving at it were absolutely beyond cavil.

An admirable article on the early recognition and treatment of the disease has been written by Wilson.[4] Increase in the pulse-rate, delayed involution of the uterus, and changes in the lochia, are the three most important early signs, and any deviation from the normal in respect of any of them should immediately awaken suspicions of infection. As regards treatment, the vulva and vagina should be first inspected, and any stitches there being let go, the infected lacerations must be swabbed with an antiseptic. He has adopted the use of medical **Izal** for this purpose, as advised by Knyvett Gordon, and considers it the best; and he subsequently uses the **Sharp Curette** to the interior of the uterus, in the manner practised by the same authority.

Strychnine, Ergot, and **Quinine** are employed to stimulate uterine contraction, and the general treatment usual in septic cases is adopted, Serum treatment has not proved successful in his cases, but a **Vaccine** used in one case gave good results. He speaks very favourably of Pryor's treatment, of opening the posterior vaginal cul-de-sac and packing the pouch of Douglas with iodoform gauze. The fluid found there commonly contains streptococci and *B. coli communis*. In this writer's opinion it is most successfully applied in post-abortional cases of sepsis. Hysterectomy is only to be advised where there are definite abscesses or a sloughing myoma in the uterine wall. Wilson does not think well of ligature of the pelvic veins in these cases, believing that thrombosis indicates a conservative process, besides the difficulty of diagnosing its presence. In puerperal peritonitis he has had good results from **Multiple Drainage Incisions.**

Whitridge Williams[5] reports five cases of **Ligature and Excision of Thrombosed Veins** in the treatment of puerperal pyæmia, with four recoveries. His conclusions are: (1) That as the average mortality of puerperal pyæmia is over 66 per cent, any operation which affords a chance of reducing it is welcome. (2) Forty-one operations collected by him, in which the veins were approached transperitoneally, had a mortality of nearly 44 per cent, and this mortality is susceptible of considerable lowering. (3) Operation should be undertaken as soon as a worm-like mass can be palpated at the outer end of the broad ligament in a patient presenting rigors and a hectic temperature. (4) Excision of the veins is rarely indicated, simple ligature usually being sufficient. He adopts the transperitoneal method, and after packing of the intestines, carefully palpates the pelvic veins. Any hardness in their course is an indication of thrombosis. A small incision having been made through the peritoneum over them, a single catgut ligature is applied, well above the upper end of the thrombus. The internal iliac veins present the most difficulty. They lie to the right of either internal iliac artery, and must be well exposed by

retracting that structure before applying the ligature by means of an aneurysm needle.

V. Bardeleben[6] writes in a similar strain. After a careful selection of cases hitherto published, he concludes that the mortality is about 33 per cent, obviously a great improvement on that of cases not so treated.

Vaccine Therapy is discussed by Hewetson, who reports two successful cases so treated. Both of these were of the chronic pyæmic type, and in each the causative organism was isolated and employed to prepare the vaccine. In acute cases, the treatment has in his hands been without the slightest apparent benefit, and on logical grounds he does not expect it to prove a success.

References.—[1]*Brit. Med. Jour.* Aug. 7, 1909; [2]*Brit. Jour. Obst. and Gyn.* Jan. 1909; [3]*Amer. Jour. Med. Sci.* Aug. 1908; [4]*Intercol. Med. Jour.* of Australia, May 20, 1909; [5]*Amer. Jour. Obst.* May, 1909, in *Brit. Jour. Obst. and Gyn.* July, 1909; [6]*Berl. klin. Woch.* 1908, No. 6, in *Brit. Jour. Obst. and Gyn.* Nov. 1908.

PYELITIS. *Francis D. Boyd, M.D.*

Acute pyelitis or pyelonephritis is discussed by a number of authors. The condition varies from the pathological standpoint. In one variety the infection extends upwards from the urinary tract, and may be termed the *urogenous type*, while in the other, the *hæmatogenous* type, the infection is through the blood-stream, and the pelvis of the kidney is but little affected. The organisms responsible for the infection in both types are colon bacilli, staphylococci, streptococci, gonococci, and *Proteus vulgaris*. It is generally believed that the gonococcus when present simply prepares the soil by producing a preceding inflammatory lesion in the urinary tract, and that the colon bacillus and ordinary pus organisms play the chief rôle. The pathological changes vary with the source of infection. In the urogenous type the renal changes are preceded by changes characteristic of an acute or chronic pyelitis. In the hæmatogenous type the affection may take such a hyperacute form that only congestion and turbidity of the kidney parenchyma are found, death taking place a few hours after the onset of the symptoms. In both forms the most characteristic evidence of infection is the presence of a large number of miliary abscesses on the surface of the kidney. Clinically, various types of the disease may be recognized.

1. Hæmatogenous Clinical Varieties.

(*a*). *The Hyperacute Hæmatogenous Form.*—The clinical course is so rapid, and the symptoms of a virulent infection are so marked, that any symptoms pointing to the kidney as the source of infection are obscured by the general sepsis. There is sudden onset, with great prostration, high fever, rapid pulse, vomiting, and a marked leucocytosis. In some cases there is severe abdominal pain and tenderness over the costovertebral angle. The differential diagnosis from an acute abdominal illness, such as perforated ulcer, cholecystitis, or

appendicitis, may be difficult, if not impossible, if the urinary examinations be negative.

(*b*). *Acute or Intermediary Hæmatogenous Form.*—In this type the symptoms follow one of the acute infectious diseases or a local septic focus such as a carbuncle. There is sudden onset of fever, with possibly a rigor and other evidences of severe infection. There is tenderness over the costovertebral angle.

(*c*). *Subacute Hæmatogenous Form.*—The principal symptoms are long-continued fever of an irregular character, accompanied by unilateral costovertebral tenderness.

In the two latter forms urinary findings are more constant than in the hyperacute. Pus, blood, casts and albumin are present in the majority of cases.

2. Urogenous Clinical Varieties.

(*a*). *The Recurrent Febrile Urogenous Type* gives symptoms very similar to the hæmatogenous subacute form, but the history differs somewhat. A patient who has had cystitis will suddenly have one or more chills, with high temperature and profuse sweats. The symptoms will last several days and then subside, to be followed in a few days by a recurrence of the sudden fever, and the same cycle will be repeated a number of times. The diagnosis presents no difficulty.

(*b*). *The Chronic Urogenous Type* is always secondary to a cystitis, and the clinical picture is that of pyelitis. There is a varying amount of fever, pain in the loins, anæmia, and loss of weight. The urine contains pus. Its reaction depends upon the micro-organism causing the infection. If the colon bacillus be present the urine is acid, while a urea-decomposing organism will render it alkaline. No reliance can be placed upon the form of the epithelial cells as an indication of the source of the pus in the urine. The only reliable evidence of the source of the pyuria is a careful study of the clinical symptoms.

Pyelonephritis during infancy and childhood differs but little from the forms just described. It is frequently a cause of obscure fever in young children, the infection being through the blood-stream, with the source in the intestine. Pyelonephritis in pregnancy and during the puerperium is, as a rule, upon the right side, and is frequently the cause of sudden obscure attacks of fever, and may show but few localizing symptoms.

Treatment.—In the hyperacute hæmatogenous form of pyelonephritis the treatment is by **Operation,** even in the presence of severe sepsis. Recovery will be the rule if operation is not too long delayed. In the less acute cases there appears to be a distinct tendency to spontaneous cure, though the acute inflammation may be followed by a chronic condition of bacilluria which may lead to subsequent attacks. Most observers doubt the efficacy of urinary antiseptics in the treatment of the condition. Some advise the use of **Urotropin**

or **Helmitol**, though admitting that, while improvement may take place, drugs do not succeed in banishing the infective agent. If the urine be acid, benefit is sometimes obtained by rendering it alkaline by the administration of large doses of citrate of potash. An alkaline urine is a less suitable nidus than an acid for the growth of the *B. coli*. **Anticoli Serum** in doses of 20 cc. has given good results in a number of cases, either alone or accompanied by a vaccine prepared from the micro-organisms cultivated from the patient's urine. Any medical measures of treatment must be combined with rest in the recumbent posture, milk diet, the use of copious diluents, and aperients as necessary.

References.—Cobb, *Ann. Surg.* Nov. 1908, p. 680; Wright, *Pract.* Mar. 1909, p. 344; Eisendrach, *Amer. Jour. Med. Sci.* Feb. 1909, p. 246; Scheidemandel, *Deut. med. Woch.* July, 1908, p. 1351; Hicks, *Pract.* Sept. 1909, p. 419, in *Brit. Med. Jour.* Jan. 1909; Butler, *Lancet*, June, 1909; Guggisberg, *Cor.-Blatt. f. Schweizer Aerzte*, 1906, No. 7; Cumston, *Amer. Jour. Med. Sci.* July, 1908, p. 87; Rovsing, *Hospitalstidende*, lii. No. 19; Göppert, *Berl. klin. Woch.* Apr. 1909, p. 639.

PYLORIC STENOSIS. (*See* Stomach, Diseases of.)

PYORRHŒA ALVEOLARIS. *Robt. Hutchison, M.D.*

Wakefield[1] recommends the local use of equal parts of tincture of **Iodine** and tincture of **Aconite** for disinfecting the pockets at the roots of the teeth.

Reference.—[1]*Brit. Med. Jour.* Sept. 19, 1908.

RECTUM, DISEASES OF. (*See also* Hæmorrhoids.)

Sir Charles Ball, M.Ch., F.R.C.S.

Congenital Malformation.

In one of a series of demonstrations given at the Royal College of Surgeons of England, A. Keith[1] deals with specimens of congenital malformation of the rectum and anus. His observations are based on thirty-seven cases in the museum of the Royal College of Surgeons and seventy-seven in the museums of the Metropolitan medical schools.

His classification differs from that of others in that sex, and the relationship of the rectum to the sexual organs, are made the basis of grouping. In the male, that form of abnormality where the rectum opens into the urethra is made the centre round which the others are grouped; in the female, the type where the rectum opens into the vulva is made the central form (*see Figs.* 78 and 80).

The type of malformation of the rectum in the male is indicated in *Fig.* 78; and of this form there are thirty-three examples in the list on p. 518, *A* 1: *Fig.* 79 indicates all the varieties of malformation in the male included in group *A* of the table..

The abnormality in the female shown in *Fig.* 80 corresponds exactly to the form in the male where the rectum opens in the floor of the urethra at the lower end of the veru montanum. In both sexes, the opening is situated immediately below the opening of the genital

ducts into the cloaca. There are six examples of this condition in the series of specimens, *B* 1. *Fig.* 81 indicates all the varieties of malformation in the female included in group *B* of the table.

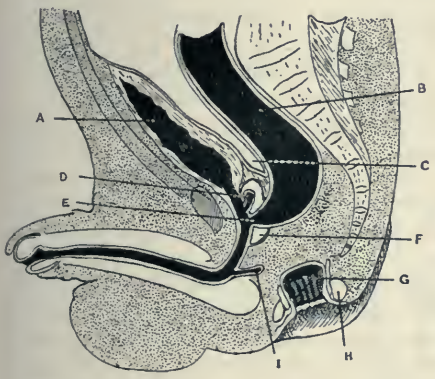


Fig. 78.—Section of pelvis of a male child, showing the rectum opening into the prostatic part of the urethra. **A** Bladder; **B** rectum; **C** recto-vesical pouch; **D** uterus masculinus; **E** intracloacal anus; **F** prostate; **G** proctodæum; **H** external and internal sphincters; **I** Cowper's gland.

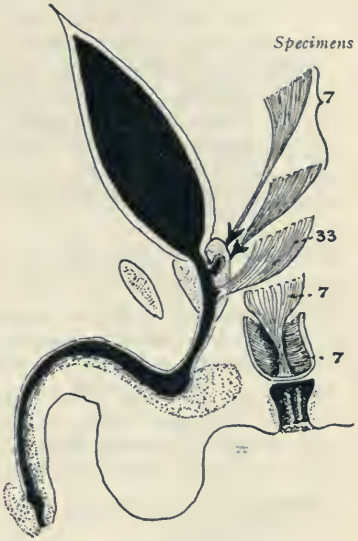


Fig. 79.—Illustrating the degrees of imperfection in the male. The rectum is shaded; the various degrees make up a series between the proctodæum and base of the prostate.

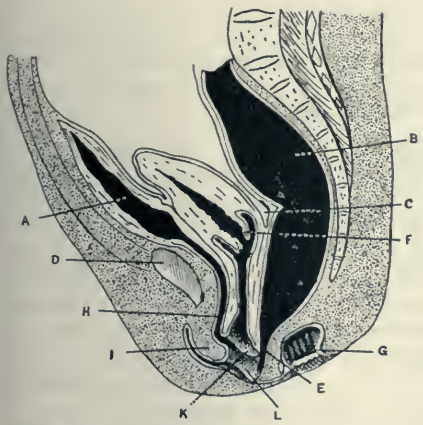


Fig. 80.—Section of pelvis of female infant, showing the rectum opening into the navicular fossa of the vulva. **A** Bladder; **B** rectum; **C** recto-uterine fold; **D** symphysis; **E** vulva-anus; **F** cervix; **G** proctodæum (rarely present if rectum opens in vulva); **H** urethra; **I** clitoris; **K** hymen.

Fig. 81.—Illustrating all the varieties of malformation in the female included in group *B* of above table.

SPECIMENS OF MALFORMATION OF THE RECTUM IN LONDON MUSEUMS.

Groups.	In Museum Royal College of Surgeons.	In Museums of Metropolitan Medical Schools.	Total
A. MALES (see *Fig.* 78):			
1. Rectum opening in urethra ..	7	26	33
2. Rectum ending as cord at or above base of prostate ..	0	7	7
3. Rectum ending as cord at site of proctodæum	2	5	7
4. Rectum ending blindly at proctodæum	1	6	7
B. FEMALES (see *Fig.* 80):			
1. Rectum ending in vulva or vagina	1	5	6
2. Rectum ending in cord above upper fornix of vagina ..	0	5	5
3. Rectum ending as cord at upper fornix of vagina	0	3	3
4. Rectum ending as cord on vagina below upper fornix ..	0	2	2
5. Rectum ending blindly or as cord at site of proctodæum..	3	7	10
C. MISCELLANEOUS SPECIMENS:			
1. Imperfect	1	5	6
2. Imperforate rectum in females with male form of external genital organs	3	3	6
3. Rectum opening abnormally..	1	0	1
4. Rare malformations	2	3	5
5. Abnormalities of the rectum in domesticated animals ..	16	0	16
	37	77	114

ULCERATION OF RECTUM.

D'Arcy Power,[2] after relating in full several cases of *ulcerative colitis*, and after an analysis of the numerous specimens of this affection in the London museums, says a consideration of these cases enables chronic ulceration of the rectum to be classified as follows :—

- Chronic ulceration of the rectum
  - Ulcerative colitis
    - Dysenteric
      - Sporadic
      - Epidemic
    - "Syphilitic"
    - Tuberculous
    - Secondary to pelvic cellulitis
  - Syphilitic
    - Gummatous
    - Ano-rectal syphiloma
  - Tuberculous
  - Carcinomatous

It will be noticed, he says, that he has laid considerable stress upon the part played by infective colitis. It used to be the custom to classify ulceration of the rectum into malignant and syphilitic inflammation. The more correct classification of the latter group is, he thinks, the one given above; ulcerative colitis occurring in those who have had syphilis, who are suffering from tubercle, or who have an inflammatory condition of the pelvic connective tissue dating from labour. On the one hand, these inflammatory conditions would, in all probability, have subsided, if the patient had not become infected with the micro-organism leading to ulcerative colitis; on the other, if the tissues had been perfectly sound, it is probable that the infective agent would never have effected a lodgement.

Ulcerative colitis, so far as it is known at present, occurs during adult life in those whose general health is lowered. It is best known in the form of "asylum dysentery," for it is almost endemic in some of the large asylums in this country; but it also occurs in isolated cases, like those which came under his care, and, so far as is known at present, without exposure to any recognized source of infection. It begins insidiously as a diarrhœa, and runs a course which is either acute or chronic, sometimes leading to perforation of the bowel in one or more places, but more often without perforation. The prognosis is extremely bad when there is marked ulceration, although, in the earlier stages, its course can be arrested by suitable means in those who are otherwise healthy.

The symptoms of ulcerative colitis are not very serious, and quite out of proportion to the severity of the disease, even when the inflammation has lasted for some length of time. The patients whom he made the text of his remarks, were curiously alike. They were ill, yet they only seemed restless and apathetic. They were anæmic, but had not lost flesh to any great extent, and they presented very few of the ordinary facial aspects of advanced disease. They took the food that was offered to them, and allowed everything to be done for them quite passively. It even crossed the minds of some of the dressers to ask whether they were not lazy people, who were making the most of an attack of diarrhœa, which had lasted somewhat longer than usual. Examination with a sigmoidoscope set their minds at rest on this point, and showed the seriousness of the condition from which the patients were suffering. The anus had lost its tone, and, as soon as it was dilated, a large quantity of foul-smelling discharge escaped from the bowel. The mucous membrane was ulcerated, and the ulceration extended as high as the instrument could be passed. The mucous membrane between the ulcers formed polypoid masses, and the blood-vessels were so delicate that they bled easily whenever they were touched. There was no evidence of healing, and the edges of a fistula which had been laid open in one of the cases showed, after a time, the callous appearances often seen in the most chronic form of varicose ulcer.

Treatment.—The treatment of chronic ulceration of the rectum is of great importance, and it has lately undergone considerable change.

The older surgeons believed that every case was due to dysentery, tubercle, syphilis, or cancer. Cases of dysentery without abscess of the liver, which are now called ulcerative colitis, were regarded as syphilitic, because these cases are sometimes curable by mercury, and surgeons fell into the fallacy known to logicians as the Undistributed Middle. They argued: "All syphilitic ulcers are cured by mercury; this ulceration is cured by mercury; therefore, this ulceration is syphilitic." But the fallacy had the excuse, that bacteriology had not—and has not yet, for that matter—advanced sufficiently to assign a specific organism to the condition known as ulcerative colitis, whilst it was clearly not dysentery of the type with which surgeons had been familiar in the tropics. It was not so acute, there was much less mucus, and there were no abscesses of the liver. It occurred too, in patients who had never been out of England, or far away from the village community where it was known that there were no other cases.

Patients should be treated by medical means in the earlier stages of the disease, because many of the sporadic cases can be cured, if they are taken in hand at once. The general lines of treatment are to prevent the accumulation of discharges in the rectum, to soothe the irritated state of the bowel, and, if possible, to prevent the multiplication of the infective micro-organisms in the mucous membrane.

After a review of the various methods of medical treatment by salines, mercury, copious enemata, injections of silver-nitrate solution, Power considers that it is only in the very mild cases of this disease that much improvement can be hoped for. Colotomy he believes to have been found wanting, but he considers **Appendicostomy,** as affording an opportunity of completely flushing out the large intestine, gives promise of better results than have hitherto been obtained.

Excision of the Rectum.

Writing on *excision of the rectum* and of the terminal portion of the pelvic colon, W. Ernest Miles[3] says that after an experience of 57 perineal excisions of the rectum for carcinoma, the recurrences were so frequent that the author abandoned this route in favour of a complete and thorough combined abdominal and perineal procedure. He thus describes the operation: This is one of the most formidable operations in surgery, entailing, as it does, the removal of practically the whole of the pelvic colon as well as the rectum. I have now performed it 12 times, with a mortality of 41·6 per cent. Nine of the patients were males, of whom four died, and three were females, of whom one died. The surviving seven patients are all at present free from recurrence, the first three having been operated upon in January, March, and May of 1907 respectively.

Preparation of the Patient.—In all cases in which there is marked stenosis of the bowel, a preliminary left iliac colostomy should be performed at least two weeks before the operation. If there be no abdominal distention, and if the lumen of the bowel be not much

encroached upon, the colon should be thoroughly emptied of its contents by the aid of enemata and mild purgation.

The Method of Operating.—The patient having been placed in an exaggerated Trendelenburg posture, a median incision is made from the umbilicus to the symphysis pubis, and a self-retaining abdominal claw retractor is placed in position. The pelvic colon is then drawn out into the wound, and a left iliac colostomy, if one does not already exist, is established in the usual situation through a second incision. I usually do this by simply pushing a loop of the uppermost part of the pelvic colon through an incision in the abdominal wall and fixing it in position in the ordinary way. Some operators advocate first dividing the bowel and then establishing the colostomy from the proximal end only, but I think that by so doing there is a greater tendency to protrusion afterwards. As soon as the knuckle of colon has been fixed in position in the manner indicated, the pelvic colon is divided transversely about two inches below it, and both ends are closed firmly by means of purse-string sutures. The closure of the distal end should be done carefully, so as to avoid leakage from that part of the bowel during the subsequent steps of the operation. The peritoneal covering of the pelvic mesocolon is then divided transversely backwards on either side, to the point where the pelvic mesocolon crosses the common iliac artery, the incisions extending into the parietal peritoneum for the distance of about one inch. The inferior mesenteric artery is then ligatured below the point where it gives off its uppermost branch to the pelvic colon. When this has been done, the pelvic mesocolon itself is divided completely as far backwards as its parietal attachment, the inferior mesenteric artery being divided below the point of ligature. The upper and remaining portion of the pelvic mesocolon is now turned upwards for the distance of an inch or more, and all the cellular tissue containing the group of lymph-nodes situated over the bifurcation of the left common iliac artery dissected carefully away. All bleeding vessels in the cut edge of the pelvic mesocolon are caught and tied.

The remainder of the operation is now practically bloodless, and should be rapidly proceeded with. The peritoneum is next divided by incisions which extend downwards into the pelvis, one on either side of the parietal attachment of the pelvic mesocolon and at least one inch distant from it, until the recto-vesical pouch is reached, when they are carried round the lateral aspects of the pelvic wall, to meet again in front, just behind the base of the bladder. In the female, the left broad ligament should be detached, together with the left ovary and tube. This having been done, the pelvic mesocolon, together with the adjacent strip of peritoneum on either side of it, is detached from the hollow of the sacrum. By keeping close to the anterior sacral ligaments, the cellular tissue containing the lymph-nodes in that situation is detached, with the pelvic mesocolon, in one piece. This separation is continued downwards in the middle line as far as the sacro-coccygeal articulation. A similar method of

blunt dissection is then carried out anteriorly, by which means the bladder is detached as far as the prostate gland. Attention is now paid to the separation of the lateral aspects of the rectum, and it is here that great care must be exercised, to avoid injuring the left ureter, which adheres closely to the peritoneum as it skirts the wall of the pelvis. When the ureter has been defined, it should be carefully freed as far as the base of the bladder. On the right side the ureter need not be seen. The dissection is then carried downwards on either side, and the lateral ligaments of the rectum are divided with scissors. In these structures the middle hæmorrhoidal arteries are found, but seldom require a ligature. This lateral dissection is carried down to the upper surface of the levatores ani. When the rectum has thus been freed on all sides as far as the points indicated, the whole of the detached structures are crowded down into the pelvis and covered with sterilized gauze. Provided that the divided end of the colon has been firmly closed, considerable pressure may be made upon it from above without fear of leakage. The edges of the pelvic peritoneum are now sutured so as to re-establish the pelvic floor. This having been done, the pelvis is thoroughly flushed with saline solution, and the abdominal wound closed.

The patient is now turned over and placed in the right lateral and semi-prone position, so that the perineal portion of the operation can be proceeded with. A purse-string suture having been inserted round the anus to prevent escape of its contents, a transverse incision is made at the level of the sacrococcygeal joint, and from the centre of this a median incision is carried down to within an inch of the anus. From the lowermost extremity of the latter, a semicircular incision is made round the anus on either side, meeting anteriorly at the central point of the perineum. These last incisions should include as wide an area of skin as possible, so as to insure excision of the zone of downward spread. After reflecting the skin on either side to the requisite extent, the coccyx is removed, and the interval between the levatores ani defined. These muscles should be divided as far outwards as their origin from the "white line," so as to include the lateral zone of spread. The remainder of the fascia propria of the rectum is then detached from the lower part of the sacrum, when the pelvic colon and the rectum, which lie loose in the hollow of the sacrum, can be drawn out of the wound. The lower part of the rectum is then dissected from the prostate or the vagina, as the case may be, care being taken to remove the cellular tissue in its vicinity as freely as possible. The resulting chasm is then freely irrigated with saline solution, and all bleeding vessels are tied. Finally, the skin margins are brought together with sutures, and a large drainage tube is inserted in the anterior and the posterior extremities of the median incision. The patient is now turned upon his back and, as the final step of the operation, a small opening is made into the extruded bowel, to allow of the escape of flatus.

The operation thus performed takes from an hour and a quarter to

an hour and a half, and, so far as my experience goes, the patient suffers from no more shock than after an ordinary perineal excision.

The mortality after the operation appears to be high, but it must be remembered that the disease for which it is performed claims a mortality of 100 per cent if left alone, and of over 91 per cent from recurrence when operated upon by the perineal methods. The causes of death in my cases have been: one from hypostatic congestion of the lungs, one from strangulation of a knuckle of small intestine which had become herniated through a rent in the peritoneal pelvic floor, one from gangrene of the stump of the pelvic colon below the colostomy, and two from peritonitis. With the exception of the first named, I regard all these causes of death as preventable with further experience of the operation and with improved technique, and therefore hope that in a future series of cases I shall be able to show a lower rate of mortality than 41·6 per cent.

"*The Rectal Shelf.*"—George Blumer[4] says that when carcinoma of the stomach or other of the abdominal viscera has involved the peritoneum, implantation metastases are apt to form in other parts of that membrane. From its dependent position, Douglas's pouch appears to be especially vulnerable, and its accessibility to digital examination through the rectum enables the surgeon sometimes to obtain early important information of the dissemination of cancer. He describes the condition found on rectal examination as follows: The lower part of the bowel is usually normal, and not until the prostate is passed is any abnormality usually detected. In some cases just above the prostate, in others at the limit of palpability, two to four centimetres above, the finger, passed along the anterior rectal wall, impinges on a shelf of almost cartilaginous hardness which projects into the rectal cavity. In some cases, further palpation shows that the whole rectum is involved in an annular zone of infiltration, more marked anteriorly, and tapering off towards the posterior wall. This condition is termed by Schnitzler "signet-ring stricture." In such cases the infiltration is no longer confined to Douglas's pouch, but involves the submucosa of the rectum, in which it may spread widely. The infiltrated area is more or less fixed, and is shelf-like or peg-like. The mucous membrane over it is not ulcerated. This absence of ulceration, and the peculiar shape, distinguish the rectal shelf from primary cancer of the rectum. Further, blood and pus are not passed. It is possible to mistake other conditions for the rectal shelf. The lower fold of Houston is sometimes thickened, but this should not cause confusion, as this has not the board-like feeling of the rectal shelf. In one case Blumer was deceived by a small subperitoneal myoma which projected into Douglas's pouch and impinged on the rectal wall. The clinical value of the rectal shelf varies. In some cases it merely confirms the diagnosis; in others it is of great diagnostic and prognostic value. It may point to a latent growth in the abdomen. In the great majority of cases

the primary growth is in the stomach; in nearly all the cases the patients are males. In females, cancer cells gaining access to the peritoneum tend to become implanted in the ovary, producing metastasis there. Dr. Blumer has found the rectal shelf in five out of nine cases of cancer of the stomach. It is of bad prognostic import, for glandular metastases are almost certainly present, and radical operation is contraindicated. When the primary growth is latent, the metastasis has been taken for it, and has even been excised as cancer of the rectum. Symptoms of rectal obstruction may be marked.

Spinal Anæsthesia.—Collier F. Martin, of Philadelphia, reports 87 cases in which tropacocain and stovaine were employed. The method is not recommended where the hips of the patient have to be elevated. Of the 87 cases, 57 were either frankly tuberculous or the condition was suspected, 16 were alcoholics, 4 had anæmia with from 35 per cent to 60 per cent of hæmoglobin, 2 had sepsis, 2 cachexia, 2 were suffering from general debility and old age, 3 had cardiac complications, and one refused to take ether. The conditions operated upon were as follows: abscess and fistulæ 54, hæmorrhoids 21, rectal stricture 2, sacral sinus 1, fissure with fistula 2, gangrenous cellulitis 2, anal condylomata 2, rectal carcinoma (perineal excision) 2, and Ball's operation for pruritus ani 1. The only complications observed, were headache 18 times, coming on from one to three days after operation. Only three cases had severe headache lasting over one or two days. A few cases complained of some stiffness of the back of the neck and shoulders. One patient developed a temporary oculo-motor palsy, which recovered under treatment. In two cases, spinal fluid was not obtained because of the difficulty in inserting the needle with spinal deformity present. Spinal anæsthesia was selected in cases with pulmonary tuberculosis, to avoid the congestion following the use of ether. Alcoholics were also found easier to manage than when ether was used. Under spinal anæsthesia the sphincters are completely relaxed, there is no muscular spasm, and there is an entire absence of the venous engorgement and swelling of the tissues so often seen while the patient is under ether. Bleeding is not profuse, and is more easily controlled, since all parts of the rectal cavity are as accessible as their anatomy will permit. The complete muscular relaxation reduces the traumatism to the tissues. Spinal anæsthesia is at its best when used in operations about the rectum and genito-urinary tract. Careful selection of cases, drugs of uniform strength and purity, and a careful technique, will do much to re-establish the confidence of the surgeon in this method of producing anæsthesia.

References.—[1]*Brit. Med. Jour.* Dec. 12, 1908; [2]*Pract.* Aug. 1909; [3]*Lancet*, Dec. 19, 1908; [4]*Albany Med. Annals*, in *Lancet*, June 5, 1909.

REFRACTION. *A. Hugh Thompson, M.D.*

Accommodation.—It is well that all subjects should be re-studied from time to time. The figures giving the range of accommodation were determined by Donders so far back as 1864, and have since been

incorporated into all text-books dealing with the subject. The whole subject has now been re-investigated by Duane,[1] who bases his results on the examination of 600 individuals, all either emmetropic, or with any error of refraction accurately corrected by glasses, and all in physically fit condition. For the details of his procedure the original paper must be consulted. In all cases the measurement of the near point was taken from a point 1·3 cm. in front of the cornea, not from the cornea itself as in Donders's measurements, and in comparing the results with Donders's this must be allowed for. Duane comes to the following conclusions : (1) At the age of 10 the average range is 14 D, but variations up to 3 D on either side of this average occur. At the age of 20 the average has fallen to 11·5 D with similar variations. (2) From the age of 20 to that of 38 the average accommodation decreases from 11·5 D to 6·6 D. At the latter age the variations lie between 5·3 D and 8·0 D. (3) Between the ages of 38 and 50 accommodation rapidly falls, on the average from 6·6 to 1·8 D, i.e., 0·4 D every year. (4) After the age of 50 the decrease in accommodation is very slow. From 50 to 60 it is only on the average from 1·8 D to 1·2 D. These results are chiefly different from Donders's in the rapid fall between the ages of 38 and 50. The rapidity may perhaps be due to the fact that it is at this period that presbyopia is usually first corrected by glasses, and that the power to accommodate, being partly preserved by use, diminishes rapidly when once the daily necessity to do so is obviated.

A further interesting result of this investigation was that moderate myopia—particularly myopia that has been corrected by glasses—is not regularly associated with a low range of accommodation. This should be an encouragement to those who believe in the full correction of myopia by glasses to be worn both for distance and near.

Operative Treatment of Myopia.—Some important statistics have been published and summarized concerning 338 eyes operated on for high myopia at Leipzig[2] and 60 at Giessen,[3] from which it appears that the causes of failure can be classified under three headings : (1) Causes incident to the disease itself, including vitreous opacities, choroidal atrophy, and hæmorrhages. There is neither proof nor reasonable presumption that operative treatment has any effect in either causing or preventing them, but when the ophthalmoscope shows that such complications are to be anticipated, it is only tempting providence to operate. At Leipzig these causes accounted for 25 out of 70 failures. (2) Causes incident to the operation, including secondary cataract, glaucoma, and infection. These accounted for 12 out of 70 failures. (3) Detachment of the retina was the cause of the remaining 33 failures, a proportion quite comparable with the statistics of other clinics which have been published. How many of these cases would have developed detachment if they had not been operated on ? No doubt a considerable proportion, but all the evidence goes to show that a not inconsiderable residue remains in whom detachment is directly attributable to the effects of the operation. At Giessen 60 myopic eyes were operated

on between 1895 and 1906, and all the patients were followed up. Twelve years after the first operation eleven of these eyes had developed a detachment, and of these as many as four occurred within six months of the primary operation, while the remaining cases occurred at various intervals after the primary operation, one in the second year, one in the sixth, one each in the seventh, ninth, tenth, eleventh, and twelfth years. So in the Leipzig figures, on comparing the number of detachments occurring in operated eyes during any year with the number of operated eyes which remained under observation during that year, we find that in the first year 7 detachments out of 338 represents a proportion of 1 in 48; in the second year 3 out of 263, or 1 in 87, a proportion which represents about the average for all subsequent years. The evidence therefore that the operation does predispose to detachment in a few cases during the first year from the time of operation is strong. How far can these cases be eliminated in the future by a proper selection? If there are hæmorrhages in the fundus, advanced choroiditis, or vitreous opacities, the risks of the operation are decidedly increased. It may be doubted whether it should ever be performed on patients over 30 except in cases of cataract. If the fellow eye is normal or only slightly myopic, the advantage of operating is questionable. If one eye has been operated on with success, an operation on the second should certainly be deferred for a year or two if undertaken at all. If the operation on the first has been a failure, we should pause all the more before operating on the second, remembering that there have been cases of double detachment following double operation. If, on the other hand, favourable cases alone are selected, with healthy vitreous and fundus, and a myopia of − 16 or over, the operation undoubtedly enables many people to earn their own living who would otherwise have to live dependent lives. The operated eyes, however, must not be treated as normal ones, although they may dispense with the use of glasses in many cases; they must be recognized to be subject to the same risks as other highly myopic eyes which have not been operated on.

REFERENCES. — [1]*Jour. Amer. Med. Assoc.* June 19, 1909; [2]*Arch. f. Ophthalm.* lxx. 1, in *Ophth. Rev.* 1909, p. 228; [3]*Beitr. f. Augenh.* Mar. 1909, in *Ophth. Rev.* 1909, p. 228.

RETINA, DISEASES OF. *A. Hugh Thompson, M.D.*

Pigmentary Degeneration of the Retina is a term used by Hepburn[1] to include (1) retinitis pigmentosa, and (2) cases resembling retinitis pigmentosa but really secondary to chronic disease of the choroid. From a careful comparison of the fields of vision in a series of cases he comes to certain conclusions which will be of much help in distinguishing between these two conditions. In the case of primary degeneration—true retinitis pigmentosa—the earliest manifestation is the appearance of the ring scotoma, at first incomplete, corresponding to loss of function in the intermediary zone of the retina; afterwards the different portions degenerate in a regular order. The temporal side of the retina loses its function before the nasal side, so that the

nasal side of the field disappears before the temporal side. It is not as a rule until the periphery is blind that the macular region itself is lost. In secondary cases due to disease of the choroid on the other hand, the scotomata are of all shapes and sizes, and scattered indiscriminately all over the visual field. In the case of the primary disease, the cause is an obstruction to the blood circulation in the chorio-capillaris. In the secondary disease the scotomata correspond to areas where the choroid has become adherent to the retina owing to inflammatory changes, but here too the choroidal blood-vessels may become involved, and then scotomata will be found resembling those characteristic of the primary disease. Islands of vision scattered throughout the scotomata suggest that, in disease, the retinal circulation may sometimes take the place of the choroidal and produce some restoration of function in a previously blind area. The prognosis of pigmentary retinal degeneration, whether primary or secondary, depends largely on the condition of the retinal vessels.

Effects of Artificial Illuminants on the Eye.—It is now established, both experimentally and clinically, that certain rays are peculiarly liable to have injurious effects on the eye. These rays are those of short wave length beyond the violet end of the visible spectrum. Experiments of Birch-Hirschfeld,[2] Hess,[3] and others on animals have proved that ultra-violet rays are capable of producing the following effects: Conjunctivitis, cloudiness of the cornea, iritis, changes in the anterior epithelium of the lens, and definitely injurious effects on the retinal structure. Clinically, the effects are those known as "electric ophthalmia," or—for it is essentially the same affection—snow blindness. The characteristic feature of this is an acute conjunctivitis which occurs very suddenly after a latent period of some hours during which there are no symptoms. In addition to this, Birch-Hirschfeld has demonstrated the presence, in the case of five patients, of partial colour scotomata, para- or peri-central, these scotomata being most marked in the lower and inner section of the field, between 10° and 20° from the fixation point. The suggested explanation is that the rays have a definitely injurious effect on the retinal cells, those in the perimacular region being especially vulnerable on account of their relatively poor blood-supply.

These facts give point to a comparison in the relative richness in ultra-violet rays of our ordinary sources of light. Schanz and Stockhausen,[4] after spectroscopic examination, arrange them in series thus: (1) The ancient Roman olive-oil lamp, the colza-oil lamp, and the sperm or stearin candle show no ultra-violet rays. (2) The ordinary petroleum lamp and the ordinary fish-tail and argand gas burners may for practical purposes be regarded as free from ultra-violet rays. (3) Incandescent gas, spirit or petroleum mantles, the acetylene flame, and the ordinary incandescent electric light, whether with carbon or metallic filament, may all be classed together, showing a distinct extension of the spectrum into the ultra-violet. The Nernst lamp

with a globe may also be included in the foregoing class, but without a globe must be put in the next one. (4) The arc lamp. (5) The mercury vapour lamp. This contains the greatest proportion of the injurious rays.

As to the protective measures to be adopted, the first thing to be noted is that blue glasses even of deep hues are of no more use than ordinary transparent glass, as they allow the ultra-violet rays to pass through to an equal extent. Smoked glasses are far more effectual, but they have the disadvantage of being more or less opaque to the light rays. Yellow glasses are said to be effective, and Motais,[5] of Angers, has for some time advocated their use. They are said to afford great comfort in a glaring light, but their appearance is against them. Fox,[6] of Philadelphia, prescribes amethyst-tinted glasses. He was first led to the idea by observing that dentists by long use of their eyes in filling teeth with gold became temporarily gold-blind. To one thus affected he prescribed glasses made of old Philadelphia window-glass which, from prolonged exposure to sunlight, had become amethyst-tinted. The relief was prompt, and to patients suffering from asthenopia from glare, Fox has continued to prescribe lenses made from the old Philadelphia window-glass ever since. As the supply is naturally limited, he now has the amethyst-coloured glasses made artificially, and claims that they give great relief. Schanz and Stockhausen claim to have produced a glass completely impervious to the ultra-violet rays, to which they give the name of "cuphos."[4] The illuminating rays are only slightly reduced by it, namely to an extent of not more than 5 per cent with glass of ·5 to 1 mm. thick. Another sort of glass recommended by Vogt[7] is a heavy flint glass with lead in it, transparent and colourless, but absorbing the ultra-violet rays shorter than 384 micromillimetres.

A question much debated is whether it is only the rays of extreme shortness—between 250 and 300 μ—that are mainly injurious, or whether those between 300 and 400 μ are also to be guarded against to an equal extent. In the latter case, ordinary glass would appear to afford sufficient protection—it certainly affords some, so that in estimating the value of any new invention, such as those that have been alluded to, we should inquire, not what benefit does the new glass give compared to the naked light, but what does it give compared with the same light seen through ordinary transparent glass? It cannot be considered decided that as far as effect on the retina goes the ultra-violet rays are any more injurious than ordinary bright sunlight such as produces snow blindness.[8] As a protective measure, nothing is surer than the wearing of ordinary smoked glasses.

REFERENCES.—[1]*Trans. Ophth. Soc.* 1908, p. 255; [2]*Zeits. f. Augenh.* July 1908, in *Ophth. Rev.* 1908, p. 338; [3]*Arch. of Ophthalm.* May, 1908, in *Ophthalmoscope*, 1908, p. 806; [4]*V. Graefe's Arch.* lxix. 1, in *Ophth. Rev.* 1908, p. 334; [5]*L'Ophthalmol. Prov.* Feb. 1908, in *Ophth. Rev.* 1908, p. 223; [6]*Jour. Amer Med. Assoc.* July 10, 1909; [7]*Arch. f. Augenh.* June, 1908, in *Ophth. Rev.* 1908, p. 341; [8]*Berl. klin. Monats. f. Augenh.* May, 1909, in *Ophthalmoscope*, Sept. 1909.

RHEUMATISM. (*See also* BLOOD, THE, IN DISEASE.)

Robt. Hutchison, M.D.

A discussion on this subject took place at the Hunterian Society last year[1] at which, however, nothing really novel was elicited. Dr. Poynton took the opportunity of stating his conclusions regarding the bacteriology of acute rheumatism: (1) A diplococcus is a bacterial cause of acute rheumatism; (2) Rheumatism may be a cause of simple and malignant endocarditis. He also expressed the opinion that the diplococcus is the only bacterial cause of the disease. Horder expressed himself as sceptical about these conclusions. He has been unable to isolate any organism from the blood-stream in thirty cases of acute rheumatism, whereas he has obtained a positive result in twenty-eight out of thirty-three cases of ulcerative endocarditis. He believes that a possible explanation of the discrepancy between his own results and those of Poynton and Paine is that the cases from which the *Diplococcus rheumaticus* has been obtained have really been cases of ulcerative endocarditis.

Stockman[2] considers that there are two types of "rheumatic fever." In the first the temperature ranges from 102° F. to 104° F., there is much constitutional disturbance, usually several joints are very swollen and painful, there is abundant sour-smelling acid perspiration, and as the inflammation in one joint subsides, others become implicated in turn. These cases are very susceptible to salicylate treatment; they are of shorter duration, show less tendency to relapse, and are less liable to be followed by sequelæ than the others. In the second type the joints are not so prominently affected; but the fibrous tissues about the chest, the lumbar aponeurosis, the fascia lata, the peri-articular tissues, the tendon-sheaths, and the subcutaneous fibrous tissue are tender and painful, sour-smelling sweats are absent, the temperature is not so high, and salicylate treatment is not nearly so effective. These cases linger on, relapses are more apt to occur, and sequelæ such as chronic fibrositis and perineuritis are much more common.

Eustace Smith[3] contends for the rheumatic origin of inflammation of serous membranes other than the pericardium or the lining of joints, and especially for the existence of rheumatic typhlitis and peritonitis. He instances cases of the latter affection in which the rapid subsidence of the inflammation under salicylate treatment pointed strongly to a rheumatic origin.

Luff[4] suggests that the expression "chronic rheumatism" should be abandoned, and the term fibrositis (first introduced by Sir Wm. Gowers) used instead. It may be produced in three ways: (1) By exposure to wet or cold, e.g., lumbago, stiff-neck, intercostal and muscular "rheumatism"; (2) By strain, e.g., "tennis elbow," "golf elbow," etc.; (3) By the operation of various toxins, e.g., the muscular pains of influenza and other fevers, and those experienced by some persons after indulgence in certain foods or wines.

Yawger[5] also directs attention to chronic "rheumatic" myositis.

as a common condition which is frequently overlooked. It gives rise to local indurative swellings in the muscles which arise under the conditions described by Luff, and which may simulate gummata. Indurations are exceedingly common; there is a history of chronic rheumatic pains; as a rule they are less sharply defined; there is pain upon pressure with friction, and they yield to massage treatment. Gummata in muscles are relatively rare, are not usually painful, are attended by other evidence of syphilis, and disappear under anti-specific medication. The mistakes in diagnosis to which these rheumatic deposits give rise are very numerous. Many cases of cephalalgia are of this variety; involvement of the intercostal muscles has been taken for intercostal neuralgia and pleurisy; in the abdominal wall for acute and chronic appendicitis, gastric ulcer, abdominal and pelvic adhesions, calculus of the kidney, and floating kidney; involvement of the gluteal region for sciatica and hip-joint disease; in the neck they have been mistaken for swollen glands.

Treatment.—Although the standard dose of salicylate of soda may be taken as 20 gr. every four hours, Murrell[6] has no hesitation if this fails in raising the dose to 30 or 40 gr. He sees no advantage in combining it with alkalies. In the discussion already referred to there seemed to be a pretty general consensus of opinion that the **Salicylates** do little to prevent or control the cardiac manifestations of acute rheumatism. In so-called chronic rheumatism (fibrositis), Luff[4] considers that the salicylates are useless except for relieving pain. Taking acute lumbago as a type of fibrositis, he prefers a combination of **Aspirin and Pyramidon** as a pain-killer, and believes in full doses of **Iodide of Potassium** as a curative agent. Locally, he uses heat obtained from the **Electric Light Bath** and **Ionic Medication** with iodine and carbonate of lithia.

Ainley Walker[7] has collected a large amount of evidence in favour of the curative effect of **Bee-stings** in so-called chronic rheumatism, and is inclined to attribute this effect to the formic acid content of the poison.

Burton[8] has published several cases illustrating the curative effect of the stings in cases of sciatica, chronic articular rheumatism, etc. The following describes the method of carrying out the treatment: "As I have had numerous applications from members of the profession as to where bees can be obtained and how applied, may I say that during hibernation they can only be had from those bee-keepers who have box hives. They must be carried in a properly ventilated box in the pocket, and kept till required in a warm place during cold weather, not longer than three days. A small quantity of barely moistened castor sugar should occupy part of one end of the box. The lid of the box is fastened by a screw in the middle of one end; a slip of glass of the same size as the lid may be placed in a line with one side and pushed back, following closely on the lid. I have devised a modification of the spring forceps to seize the insects. Each leg of the forceps ends in a semicircle and when closed and covered with indiarubber valve tubing—the bees resent cold steel—

make a circle measuring something less than $\frac{1}{18}$ in., or a trifle less than the shoulders of the bee. This must be inserted with care between the glass and the box, as a little nervousness may allow the escape of one or more bees, to the terror of a nervous patient. When the bee is seized the forceps is secured by the automatic lock, and it should be seen that the bees in the box are equally secure, by either lid or glass, before the next move. The bee is then held close to the required spot, and very little pressure is needed to make it sting. The annexed woodcut shows the forceps made for me by Messrs. Philip Harris & Co."

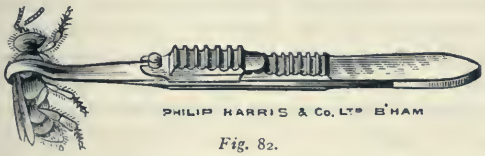


Fig. 82.

In a later note he adds: "I regret to hear from several medical men that the bee-keepers, both here and in Scotland, will not take bees from their hives during hibernation, although the editors of the *British Bee Journal* stated, in reply to a letter from me, 'It is well known that there would be little or no trouble in obtaining a few live bees at any season of the year from any expert who could have access to a hive.' I have ascertained that if the bees are put in a properly ventilated box, covered with cotton-wool, and enclosed in a second box, also ventilated, they will stand a long journey by post. They should at once be placed in a very warm position. I made a hole in the rim of a halfpenny tin plate, allowing the upright of an iron retort-stand to pass through it; the plate rests on the iron ring, or is fastened with wire to make it more secure. A spirit lamp with $\frac{1}{2}$ in. flame is placed beneath, and the ring lowered to 4 in. or 5 in. from the flame. A cheap thermometer is wired to the top of the upright, the bulb resting on the plate. By this means a temperature of 76° can easily be maintained, and the bees, if supplied with candy, as they ought to be by the vendor, require only a few drops of water on their food each day, and will keep well for several days. The spirit lamp should be filled in the evening, or the bees may be found dead from cold in the morning. My bees are quite lively at the end of four days.

"I have been asked frequently as to the pain of stinging. After the first three stings on myself, I find that the intensity of the pain is much less lasting than at first—in fact, is over in half an hour at the most. Some of the bees seem to cause greater pain than others, but I think this may be explained by a larger cutaneous nerve being wounded by the sting."

REFERENCES.—[1]Ref. in *Clin. Jour.* Aug. 12, 19, & 26, 1908; [2]*Med. Press*, Jan. 20, 1909; [3]*Brit. Med. Jour.* Nov. 28, 1908; [4]*Clin. Jour.* Aug. 19, 1908; [5]*Lancet*, July 31, 1909; [6]*Hosp.* Jan. 2, 1909; [7]*Brit. Med. Jour.* Oct. 10, 1908; [8]*Ibid.* Oct. 31 and Dec. 5, 1908.

RHEUMATOID ARTHRITIS. (*See* ARTHRITIS DEFORMANS.)

RHINITIS, ATROPHIC. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

Adam[1] regards atrophic rhinitis as the end stage of hyperplastic purulent rhinitis, because :—(1) Sinusitis is a hyperplastic process, and occurs in over half the cases ; (2) There is a series of cases of hyperplastic rhinitis in children born of mothers who themselves had marked atrophy and ozæna ; (3) Turbinal tissue from cases that one would diagnose as plain chronic sinusitis and not as atrophic rhinitis showed some of the early changes of atrophy ; (4) Inferior atrophy often occurs alongside middle hyperplasia. In atrophic rhinitis the mucous membrane is first involved, as the result of a previous chronic hyperplastic purulent rhinitis, while in more than 50 per cent of the cases, implication of the sinuses follows. Adam is not in accord with Grünwald in considering the sinusitis the *fons et origo mali*. He considers that the sinusitis is a secondary complication, and when once set up reacts upon the mucosa and perpetuates a vicious circle.

REFERENCE.—[1]*Brit. Med. Jour.* Oct. 24, 1908.

RIBS, PAINFUL DISPLACEMENT OF.

Priestley Leech, M.D., F.R.C.S.

Prof. A. Depage,[1] of Brussels, describes an interesting cause of pain in the side in women ; it is complained of generally in the right side, sometimes, but rarely, in the left. The cause is often put down to movable kidney, gall-stones, appendicitis, or ovario-salpingitis, and removal of the supposed cause brings no relief. Depage has discovered that in some of these cases there is a displacement of the 10th or 11th rib. In consequence of the slanting of these ribs they may ride over one another, or press on the iliac crest. The pain is dull, and intermittent when the patient moves or walks. Some slight degree of scoliosis, with abnormal disposition of ribs, is found. Palpation of the flank is not painful ; there is no space between the last rib and the iliac crest ; pressure on crest and on 10th and 11th ribs is painful. In four cases, the pain being intolerable, he removed the anterior extremities of the ribs with a good result. The best early treatment is **Mechano-therapeutics** and carefully selected **Gymnastics**, principally for those who can take care of themselves. Is this a neurosis ?

REFERENCE.—[1]*Brit. Med. Jour.* Oct. 3, 1908.

RICKETS. *Prof. G. F. Still, M.D., F.R.C.P.*

Observations at Cleveland, Ohio, by Thomas and Furrer,[1] showed that 40 per cent of infants and children of the hospital class between the ages of six months and two years were rachitic. This proportion, it may be pointed out, is very nearly identical with that obtained in several cities in different parts of the world ; in London, including children up to three years, it was 44·6 per cent. The commonest symptom was bending of the ribs, present in 98 per cent of the cases of rickets ; enlarged epiphyses at the wrists were noted in 90 per cent, and enlargement of the frontal and parietal eminences in 70 per

cent; dentition was delayed in 60 per cent. Other symptoms less frequent were "pot belly," kyphosis, deformity of the chest, and enlargement of the spleen. The authors point out, what is probably very true, that rickets is often overlooked because the child is not stripped and examined all over. As regards prognosis, they note that rickets is a self-limited disease tending towards gradual recovery, but if untreated, serious and permanent deformities of the bones may occur. Rickets contributes indirectly to the high mortality of young children, for bronchitis, bronchopneumonia, whooping-cough, and gastro-enteritis, which may not be disastrous to other children, are apt to be very dangerous to the rachitic child.

Etiology.—There has been much difference of opinion as to the cause or causes of rickets; English[2] summarizes the views which have been put forward; he mentions a large number of authorities as agreeing that the main or the only cause is dietetic, viz., food which is insufficient, or improper in some particular respect, whilst most consider that insanitary environment, and lack of sunshine and fresh air may be contributing causes of more or less importance. English himself believes that rickets is due to a toxæmia of microbic origin; he points to the evidences of chronic inflammatory change in various tissues in rickets as favouring this view, but he produces no actual evidence of any special bacterial infection.

Findlay[3] is of opinion that confinement and lack of exercise play a prominent part in the production of rickets; he has also studied the blood[4] in rickets, and finds some polycythæmia and increase in hæmoglobin, findings which are not in agreement with common experience. The view that lack of exercise and of oxygen are chief causal factors, seems difficult to accept in face of the undoubted fact that dietetic and cod-liver oil treatment have a very definite curative effect, without the least alteration in those conditions on which Findlay lays stress.

Aaron[5] reverts to the old idea that insufficiency of calcium salts in the food is an important factor in rickets; but the logical outcome of his observations is unfortunate, for he finds that these salts are specially low in human milk, and it is well known that they are present in much larger amount in cow's milk than in human milk. Rickets, therefore, ought to be much more common with breast-feeding than with cow's-milk feeding; but as everyone knows, this is not the case.

Treatment.—Schabad,[6] taking the view that calcium salts are lacking in the diet when rickets occurs, recommends that breast-milk should be analyzed, not merely with regard to proteid, fat, and sugar, but also with regard to the proportion of calcium salts present, and that if it be found to be specially low (the normal, he says, varies from ·036 to ·047 per cent) the deficiency should be counteracted either by giving one of the preparations of **Calcium,** of which there are many in the market, or by giving **Phosphorus** or **Cod-liver Oil,** which, he says, promote the absorption of whatever calcium salts are present in the food.

Thomas and Furrer (loc. cit.) insist upon the necessity for stopping all proprietary or other unsuitable foods, and substituting clean milk properly adapted to the age and weight of the child; they also insist upon the value of fresh air and sunshine, and recommend the following prescription:—

℞ Elixir Phosphori ℥v | Ol. Morrhuæ. ad ℥ij

Half a drachm to be given after meals three times a day.

References.—[1]*Cleveland Med. Jour.* Dec. 1907, in *Pediatrics*, Feb. 1908; [2]*Pediatrics*, Oct. 1908; [3]*Brit. Med. Jour.* July 4, 1908, p. 13; [4]*Ibid.* Apr. 24, 1909; [5]*Hosp.* June 12. 1909.

RUBELLA (German Measles). *E. W. Goodall, M.D.*

In an account of an outbreak of rubella in the Monsall Fever Hospital, Manchester, in the early part of 1908, Miles Arnold[1] states that in six cases a count of the white blood-cells showed no leucocytosis. Ehrlich's diazo-reaction could not be obtained in any, though it is commonly present in all cases of measles (morbilli) during the eruptive stage. In seventeen out of the nineteen cases, the temperature remained normal all through the attack. In no case was there any prodromal symptom; the rash was the first sign, or amongst the first signs. Arnold states that he has not yet seen clinically any proof of the existence of the "fourth disease."

Reference.—[1]*Brit. Med. Jour.* Oct. 31, 1908.

SARCOMA (Idiopathic Multiple Hæmorrhagic).

E. Graham Little, M.D., F.R.C.P.

This rare disease remains so obscure that every new case should be recorded. Lieberthal[1] claims to have seen three cases, of which this is the third. The patient was aged 63, the subject of tabes dorsalis following syphilis contracted twenty-one years before the cutaneous disease now under consideration showed itself. The first symptoms appeared on the dorsum of the right hand (*Plate XLIII*), as a red swollen tumour; similar lesions came in the course of the subsequent five or six years, on the thighs, the feet, and the other hand. Brawny swelling of the hands and feet supervened, the swollen area being studded with nodules. Some of the tumours involuted, leaving atrophied, pigmented depressions; ulceration was rare. The tissues underlying the skin do not, as a rule, become involved.

The histology of the case is well worked out (*Plate XLIV*). The epidermis was thinned; the corium was thickened, and showed numerous cavities lined with endothelium, probably newly developed and dilated old blood- and lymph-vessels. Accumulations of spindle cells, arranged in bundles or streaks, were seen, generally near blood-vessels. The connective tissue was coarse and abundant, except in the sites of cell-accumulation; elastic tissue was scanty and distorted in the vicinity of the cell-accumulations, normal elsewhere. Some of the cavities were filled with blood, which was also extravasated into the surrounding tissue. Hair follicles and sebaceous and sweat glands were almost absent in the section.

PLATE XLIII

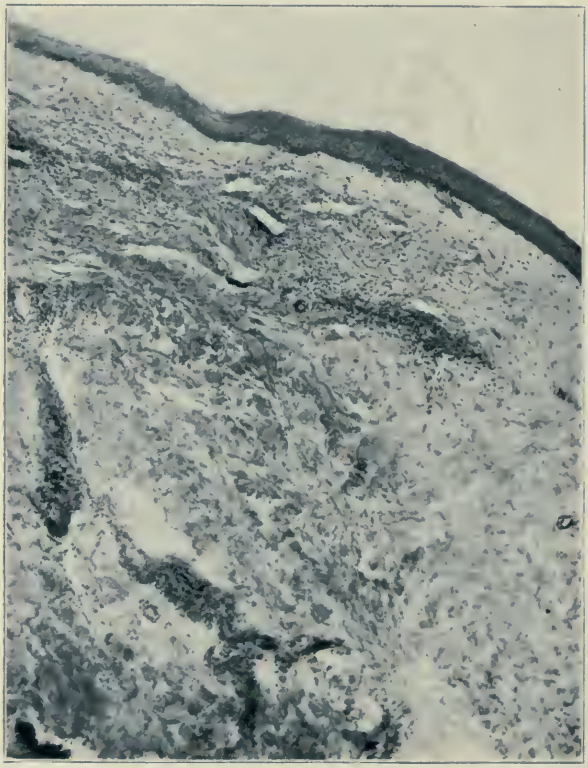
IDIOPATHIC MULTIPLE HÆMORRHAGIC SARCOMA

Tumour on dorsum of right hand

Jour. Amer. Med. Assoc.

PLATE XLIV

IDIOPATHIC MULTIPLE HÆMORRHAGIC SARCOMA



Microscopic specimen from skin of patient (× 65)

Jour. Amer. Med. Assoc.

No form of treatment seems to offer much hope of arresting the disease; arsenic and X rays have been tried with some slight success, but a fatal termination seems inevitable, usually from metastases of the growth in internal organs.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Oct. 10, 1908.

SCABIES. *E. Graham Little, M.D., F.R.C.P.*

Montgomery[1] considers that the ordinary sulphur ointment, containing 15 per cent sulphur, is too strong for the requirements of most cases of scabies; he uses this ointment diluted by half with benzoated lard. In mild cases it is sufficient to wash the body with strong alkaline soap, and then dust the parts and the sheets with precipitated sulphur. In delicate skins and in children, a combination of **Sulphur** and **Balsam of Peru,** or balsam of Peru alone, should be used :—

℞	Bals. Peru	12	Lanolini		50
	Sulph. Præcip.	12	Petrolati	ad	100

Or,

℞	Bals. Peruv.	25	Petrolati		25
	Lanolini	25			

Montgomery claims that nine successive days should be given up to the treatment, and that it suffices to boil the infected clothes to disinfect them. Other parasiticides may be used alternately with sulphur, and this alteration will often be useful in avoiding dermatitis :

℞	Styracis	80	Alcohol		
	Bals. Peruv.	20	Glycerini	āā	15

Or,

℞	Beta-naphthol	7	Petrolati		100

Or,

℞	Liq. Cresolis Compositi	50	Ol. Olivæ	ad	100

To be rubbed into the skin twice daily.

When dermatitis has occurred, apply the following paste :—

℞	Acid. Salicy·	1·5	Zinci Oxidi		15
	Amyli	15	Glycerin		30

To be applied twice a day.

REFERENCE.—[1]*California State Jour. of Med.* in *Jour. Amer. Med. Sci.* Apr. 10, 1909.

SCAPULA, EXCISION OF (The End-results).

Priestley Leech, M.D., F.R.C.S.

Nancrede,[1] of Ann Arbor, Mich., enters a plea for the consideration of the end-results of our operative procedures rather than the publications of statistics showing the success of our technique. He has collected a series of tables showing the end-results after excision of the scapula for sarcoma. The labour involved in their compilation must have been great, but their value should be of the greatest service to surgeons, and it is to be wished that his example may be followed in other departments. All cases where the microscopic

picture and the subsequent clinical course have proved that the growth was a pure enchondroma have been rigidly excluded; excisions for tubercular or pyogenic osteomyelitis and its consequences are also omitted. All the statistics of the past are absolutely misleading as to the operative mortality and end-results of total excision of the scapula for primary sarcoma. He has added twenty-two cases to those published in 1900 in Buchanan's tables; but after a careful study of the literature by himself and two competent linguists, he has felt compelled to eliminate a number of cases, so that the total is slightly below that reported by Buchanan. A study of the 65 cases of malignant disease tabulated where the scapula alone seemed involved, has led to the surprising discovery that only one case is almost certainly cured. Buchanan's case with hopeless metastases five years after excision of the scapula should serve as a warning not to be over-sanguine. One case was believed to be well four years after amputation of the arm for recurrence; seven others were followed only for under four years. Accordingly we have one practically certain cure and six probably cured, but one of these required a secondary operation, and all may have relapsed later. Putting the facts in another way, out of 65 cases, 26 were dead in less than one year; 3 inside of eighteen months; 2 lived two years; 2 lived for three years and 1 for five years before succumbing. Thirty-five then died inside of two years, i.e., over one-half. A study of the cases shows how commonly recurrence *in loco* takes place, and how probable it is that recurrences provide the foci whence generalization occurs; hence, if local recurrence is preventable by earlier operation, a certain number of fatal cases of visceral involvement might be avoided, and the question is suggested as to whether an interscapulothoracic amputation in place of excision of the scapula might not give better results.

Reference.—[1]*Ann. Surg.* July, 1909.

SCARLET FEVER. *E. W. Goodall, M.D.*

Etiology.—Of recent years there has been a tendency on the part of some sanitarians to minimize the transmissibility of the infection of scarlet fever by any other way than direct contact. But the following case shows that, as has usually been held, clothing can be infected and convey the infection. It has been put on record by C. G. Kerley,[1] of New York. The case occurred in a Hudson River village. "A little girl, a native of the village, contracted scarlet fever in Brooklyn, having returned before signs of illness appeared. The disease was very severe, and the child died. All the clothing that had been worn was destroyed, with the exception of a new coat, which the mother thought too good to burn. This was secretly wrapped in paper and put in the drawer of an unused bureau. After twelve months the mother gave the coat to a little girl in the village. The child came down with scarlet fever in a week or ten days after wearing the coat. There had been no cases of scarlet fever in the village, other than these two, up to this time. The second little girl had never

been out of the village. There was no apparent possible connection between the two cases other than that of the coat."

The same author gives an illustration of the immunity against scarlet fever which appears to be possessed by infants under one year. Scarlet fever broke out in an institution in which there were four women, each nursing an infant under four months of age, and twenty-two other children of two to six years old. The ward in which all these individuals were was quarantined, and apparently, though the account does not state definitely, none of the cases as they occurred were moved out. Every one of the twenty-two children contracted the disease, together with one of the women, who "nursed her own child through the period that she had the disease. Neither her own child nor the other three nurslings took scarlet fever. On the contrary, they throve and grew fat in the atmosphere, about ten weeks being required to complete all the cases."

Pathology.—A most interesting and important contribution to our knowledge of the rheumatism that is associated with scarlet fever has been made by F. J. Poynton.[2] It is well known that in a certain number of cases of scarlet fever, varying from about 1 to 4 per cent, just as the rash is disappearing and the temperature showing signs of settling down to normal, but occasionally later, arthritis sets in. Usually this is slight, though several joints may be affected. The trouble affects chiefly the smaller joints, and is prone to shift somewhat rapidly from one joint to another. The condition readily yields to treatment by salicylate of soda, and relapses are not common. The temperature is moderately raised during the attack, but perspiration does not, as a rule, occur. Nor is implication of the heart common; hardly can even a murmur be detected. The patient makes a speedy and complete recovery, and leaves the hospital quite well.

There has always been discussion as to whether this form of arthritis was to be considered of the same nature as ordinary acute rheumatism (rheumatic fever). The chief facts in favour of a close relationship are, that a person who, having previously had rheumatic fever, contracts scarlet fever, is very likely to have another attack of rheumatic arthritis with, or immediately after, scarlet fever; and that the disease is very amenable to treatment by the same remedies, especially the salicylates, as those which benefit acute rheumatism. On the other hand, the arthritis is seldom severe, and is rarely accompanied, or immediately followed, by such well-known manifestations of rheumatic fever as inflammation of the heart and chorea.

As has already been said, in most cases the patient leaves the fever hospital in a good state of health, and never again comes under the observation of the medical officer of the fever hospital; and certainly the prognosis of scarlatinal rheumatism given by the medical officer of fever hospitals is usually a favourable one. The observations of Poynton, however, will probably lead to a modification of this opinion. He traced the histories of twenty-five children who were known to have had scarlet fever, the attack in most instances being

followed immediately by one of ordinary scarlatinal rheumatism; and he found that all these children, though they emerged from the attacks of scarlet fever and rheumatism apparently unscathed, subsequently developed fresh attacks of arthritis or such rheumatic sequels as chorea and chronic heart disease. One of the cases was fatal. The patient was a girl aged 6 years, who died of pericarditis and endocarditis. A minute diplococcus, having the cultural and morphological characteristics of the rheumatic diplococcus, was isolated from the pericardial exudation by Dr. Paine. Intravenous injection of this organism gave rise in rabbits to arthritis, pericarditis, and endocarditis.

Diagnosis.—In a series of articles the diagnosis of scarlet fever has been discussed at some length by H. E. Cuff, J. E. Beggs, A. Whitfield, and the writer[3] of this abstract. Difficulties of diagnosis arise from the sore throat, the rash, and the desquamation. From the sore throat alone before the rash has appeared, or in those cases in which the rash is wanting, it is extremely difficult to make a diagnosis; but "repeated vomiting, headache, pallor round the mouth and nose, enlargement of the filiform papillæ of the tongue, and, if the temperature is but moderately raised, a pulse the frequency of which is out of proportion to the height of the temperature," suggest scarlet fever. Severe cases of scarlatina anginosa, in which the rash comes out late, are also frequently mistaken for diphtheria; but in scarlet fever of this variety there are continuous pyrexia, delirium, extensive inflammation of the fauces followed by ulceration, enlargement and matting together of the cervical glands, and emaciation. In diphtheria, the temperature usually falls soon after the beginning of the illness, and in severe cases becomes subnormal in three or four days. The exudation is well defined and, more often than not, definitely membranous, while the faucial swelling is less. Ulceration is rare. Treatment by diphtheria antitoxic serum has no effect on the faucial lesion of scarlet fever.

Of rashes, those most frequently confounded with the rash of scarlet fever are various erythematous rashes (apart from those which occur in some other of the acute infectious diseases), initial rashes of measles, chicken-pox, and small-pox, rubella, an erythema that occasionally accompanies influenza, septic rashes, and drug rashes.

Amongst the first, fugitive rashes, which are seen in young children, are frequent sources of error. They are usually patchy and not punctate. Apparently they are due sometimes to the wearing of flannel next the skin. The initial rash of measles closely simulates the ordinary rash of scarlet fever; but on inspection of the buccal mucous membrane Koplik's spots will be seen, and symptoms of catarrh of the upper respiratory tract are nearly always present. The initial rash of varicella is very soon—in a few hours—followed by the papular and vesicular eruption characteristic of the disease. The initial rashes of small-pox are of two kinds, the erythematous and the petechial. The former may be distributed more or less universally over the trunk and limbs, and may even affect the face; but it may

be confined to the region of the joints and limited areas on the trunk. Usually these rashes are not so markedly punctate as that of scarlet fever. According to Dr. J. MacCombie, they are not met with in children under ten years of age. The petechial eruption affects especially the abdomen below the umbilicus, and the upper and inner aspects of the thighs, a distribution which is diagnostic.

The rash of rubella (German measles) may be very like the erythema of scarlet fever, but it usually commences with small, discrete spots, and affects the face. Cuff states that in the scarlatiniform variety of rubella, the rash is sometimes very marked on the outsides of the thighs when it is fading on the trunk.

The scarlatiniform rash occasionally met with in influenza may be very brilliant, but is rarely punctate. The whole of the skin may be affected. Desquamation may follow.

Septic rashes are more often morbilliform than scarlatiniform, and affect especially the extensor surfaces of the limbs. When scarlatiniform, they are not accompanied by inflammation or soreness of the fauces, strawberry tongue or circumoral pallor ; and a septic wound or some source of septic infection, is present. It is to be remembered, however, that occasionally simple tonsillitis is accompanied by a rash which is usually non-punctate and transitory. According to Whitfield, the rash of tonsillitis may end abruptly with a sharp margin at the middle of the forearms.

Drug rashes, as a matter of fact, seldom appear to give rise to much trouble in diagnosis. The history that a drug has been taken is usually forthcoming. Belladonna and quinine rashes most closely resemble those of scarlet fever. An enema will produce a scarlatiniform rash only when it is composed of ordinary hard yellow soap. The writer can state that since he has employed the *sapo mollis* of the B.P. for making enemata, he has not seen any enema rashes.

Both Whitfield and the writer draw attention to recurrent scarlatiniform erythema as a source of error. It is fortunately not of very frequent occurrence. The rash is patchy, may be confined to the trunk, and is of longer duration than in scarlet fever. Often, however, the condition is not recognized till the patient has undergone two or three attacks of the disease.

Desquamation.—It is often forgotten that peeling may occur after any form of erythema, and on the other hand is occasionally absent after an attack of scarlet fever. The well-known "pin-hole" desquamation is most common after scarlet fever, but may certainly occur occasionally after other rashes. In a case which does not come under observation till a late stage, the diagnosis of scarlet fever can usually be made when peeling is accompanied by some complication of scarlet fever—arthritis, nephritis, adenitis, or otitis.

TREATMENT.—For the treatment of pyrexia, Kerley[1] strongly recommends **Cold Packs** given in the following way :—

"A large bath towel or some thick, soft, absorbent material should be used ; muslin, linen, or any thin material does not answer as well.

Slits are cut in the towel large enough for the arms to pass through, and the towel is folded around the body, enveloping only the trunk and buttocks. A hot-water bag, carefully guarded, should be placed at the feet, and the patient covered with a blanket of medium weight. The towel is moistened with water at 95° F. This higher temperature is necessary at first, in order not to frighten the patient, as sudden cold is apt to do, and also to avoid shock. In two or three minutes the towel, without being removed, is again moistened with water at 90° F., later with water at 85° F., and still later at 80° F. When the temperature of the water reaches 80° F. it is better to hold it at this point for half an hour; then the patient's temperature should again be taken. If at the beginning his temperature was 105° F. and now shows but slight or no reduction, the temperature of the water with which the towel is moistened should be reduced to 70° F., or, if necessary, even to 60° F. Throughout, the child need not be disturbed, except to turn him from side to side to wet the towel with water of the desired temperature, this being one of the advantages of the pack over a tub bath or sponging."

" Duration of pack: For the first hour or two in a pack the temperature of the patient should be taken every half hour. When it is reduced to 102° F. the pack should be removed, for, if it is continued longer, too great a reduction may take place. If it rises again rapidly to 105° F. or higher, it is well to keep the patient in the pack continuously. The degree of cold necessary, in the individual case, to keep the temperature within safe limits will soon be learned. I recently kept in a pack for seventy-two hours a boy four years old, with a lobar pneumonia. In this case a continuous pack of 70° F. was required to keep the temperature at 104° F. or slightly lower. The towel or other material employed should not be used for more than six hours, when it should be changed for a fresh one. Another reason for frequently taking the temperature is, that early in the attack we do not know how it will be affected by the continued cool applications. In some children it is very readily influenced, and in such a case collapse might follow a very sudden reduction of the temperature. In cases readily controlled, the pack may be necessary for only half an hour or an hour, at intervals of three or four hours. An ice-bag may with advantage be kept at the head when the child is in the pack."

Hourson[4] gives an account of several very severe cases of scarlet fever, with high temperature and marked cerebral symptoms, in which treatment by **Warm Baths** was most efficacious. The water should be at a temperature of 90° to 95° F., and the baths be given every two hours. The duration should be 15 minutes. In private practice the ordinary bath or tub may be employed.

In a paper entitled " The Home Treatment of Scarlet Fever," Robert Milne[5] advocates the treatment introduced many years ago by J. Brendon Curgenven to prevent the spread of the disease. This consists in rubbing the patient "all over the body, from the crown of the head to the soles of the feet," with **Eucalyptus Oil.** The inunction

is done twice a day for the first four days, and after that once a day till the tenth day. Dr. Milne also paints the tonsils with 1–10 carbolic oil every two hours for the first twenty-four hours. Dr. Milne and those who advocate this form of treatment evidently believe that they render the scarlet-fever patient quite harmless so far as his power of spreading the disease is concerned. And Dr. Milne is further of the opinion that the severity of the disease is lessened and the liability to complications diminished. A careful perusal of his paper, however, does not convince me of the soundness of his conclusions. But before I proceed to point out wherein the weakness of his demonstration lies, I will admit that Dr. Curgenven and Dr. Milne have taught us one fact, namely, that many cases of scarlet fever do not remain infectious for more than two or three weeks, and that the desquamation after that period, and perhaps earlier, is not necessarily infectious. Both the observers whose opinions I am now criticizing, appear most firmly to believe that the peeling of scarlet fever is infectious even at a late stage; and they attribute the failure of their patients to spread the disease to the efficacy of the eucalyptus; whereas the observations of epidemiologists during the past few years go to show that many cases of scarlet fever are not infectious after the third week, and that the late desquamation is not infectious. From this one is led to conclude that in all probability Dr. Curgenven and Dr. Milne would have obtained the same results even if they had not used eucalyptus.

It is quite clear, however, from Dr. Milne's paper that occasionally some of his patients are infectious even when treated with eucalyptus. Thus we are told concerning the children of Mr. H., that one of them contracted scarlet fever. Dr. Milne's treatment was "fully and faithfully carried out. The children mingled with each other freely throughout the case without any infection resulting. In convalescence the children went to the seaside for six weeks. On their return they travelled with some school children on their way home. In a few days another of their number was attacked, doubtless from contact with their little fellow-travellers." This appears to mean—for the expression is not very clear—that another of the H. children caught scarlet fever from one of the school children with whom the H. children travelled. If this is what is meant, it is a pure assumption, as no evidence is given that these school children had recently been suffering from scarlet fever. From what is known of the chronicity of that disease, it is most probable that the H. child who suffered a few weeks earlier from scarlet fever was the source of this second case in the family.

Later in his paper, Dr. Milne gives the case of a young nurse who was attacked with scarlet fever after (though the account does not state how long after) she had been applying the inunction treatment to some children. Dr. Milne explains this failure by assuming that proper care had not been exercised, though he does not say what the laxity was; and to most persons the more obvious explanation will be that the nurse took the disease from the patient in spite of the eucalyptus.

Dr. Milne gives a very brief record of an outbreak of scarlet fever that took place in Dr. Barnardo's Village Home for Girls, Barkingside, and continued from December 16th, 1904, to April 2nd, 1905. There were 95 cases altogether amongst 1,100 girls, and the facts that there were so many cases amongst so many children, and that the epidemic lasted for three and a half months, are not much in favour of the eucalyptus inunction. And here, again, Dr. Milne assumes that certain cases, which ought not to have occurred but did occur in spite of the eucalyptus, were "due to outside and not to case-to-case infection." But the most curious fact stated by Dr. Milne with respect to this outbreak is that "the most careful separation of the infected children, and isolation of those who had been exposed, was carried out." One asks, Why were these measures put into practice if inunction with eucalyptus is sufficient? Though the paper is entitled "The Home Treatment of Scarlet Fever," yet most of Dr. Milne's experience is derived from institutions (Dr. Barnardo's Homes and Hospital). He gives instances, it is true, of the application of the treatment in the houses of the well-to-do; but I am inclined to doubt whether he would get such good results—or apparently good results—in the crowded homes of the poor of the East End. Dr. Milne's paper has attracted some attention amongst those who are engaged in the treatment, especially the preventive treatment, of infectious diseases; and therefore I have alluded to it at some length. It is to be regretted that more detailed and clearer information has not been given; for I confess that nothing recorded in the paper convinces me of the value of eucalyptus inunction.

In an article entitled "*The Meninges in Scarlet Fever*," Benard[6] discusses the various forms and causes of meningitis in that disease. Apart from inflammation of the ear or nose, this complication is very uncommon; that is to say, it is usually secondary. The author divides meningeal complications into three groups: (1) "Meningeal infection"; in this group lumbar puncture shows micro-organisms without any evidence of inflammation; there are no clinical symptoms of meningitis. (2) "Meningeal reaction"; here there are varying degrees of reaction, from mere high tension of the cerebrospinal fluid, shown by lumbar puncture, up to marked lymphocytosis of the fluid, and, anatomically, intense meningeal congestion. Clinically there is delirium, more or less noticeable. (3) "Meningitis properly so-called;" these cases are serofibrinous or purulent, and the symptoms of inflammation of the meninges are well marked. The microbe most commonly found in the fluid obtained by lumbar puncture is a streptococcus.

Treatment.—In the group of cases known as "meningeal reaction," repeated **Lumbar Puncture** seems to give good results. In cases of the third group **Warm Baths** should be given, and repeated lumbar puncture employed. Intravenous injections of **Collargol** or **Electrargol** are also recommended. But the prognosis in cases of this group is very grave.

References.—[1]*Jour. Amer. Med. Assoc.* Oct. 24, 1908; [2]*Quart. Jour. Med.* Oct. 1909; [3]*Pract.* Jan. 1909; [4]*Jour. Amer. Med. Assoc.* Nov. 17, 1908; [5]*Brit. Med. Jour.* Oct. 31, 1908; [6]*Rev. de Med.* May 10, 1909.

SCHISTOSOMIASIS. *J. W. W. Stephens, M.D.*

B. S. Elgood[1] contributes some new facts bearing on the etiology of *Schistosomum hæmatobium* (bilharzia) infection. The authoress found among school-girls, age 12 to 16, of the lower middle class in Cairo, 27·5 infected, and also the same percentage infected in the girls, age 6 to 13, of another school of a slightly higher class. The evidence appeared to be against the view that they were infected by paddling or bathing in dirty water, and the authoress considers that the infection is through drinking water which is not stored in a clean manner. Further, an examination of the urine of adult females of the respectable lower middle classes in hospital in Cairo, showed an infection of only 3·2 per cent. (The incidence among *peasant* women is unknown.)

A. Looss[2] disagrees with the views put forward by the previous writer. He first points out that among peasant women infection was greatest among those who work in the fields like men; among women who do not it is practically *nil*, though other conditions are alike. But it has been shown that the town population is also infected, viz., the children to the extent of 70 per cent. Dealing now with the mode of infection, Looss points out that it hardly suffices to suggest that the school-girls in Cairo are infected by badly stored water, unless a probable mode of infection of the water with urine (containing the eggs of bilharzia) is at the same time afforded. Looss states that it is inconceivable that the drinking water (pipe supply) could get contaminated with urine. Nor is an infection through vegetables contaminated with river water (containing eggs) possible, as otherwise European children and adults would not escape. The author considers that the mode of infection is through the skin. In the case of children this probably takes place through contamination of the ground, small puddles, etc., with ova by urination, and consequent infection of other children, the habits of the children playing about in puddles, rolling on the ground, etc., being such as to promote entry of the miracidia.

J. F. Allen[3] considers that the miracidia enter through the urethra, as shown by the fact that the membranous portion of the urethra is the first and sometimes the sole point to be infected. He considers that infection takes place during bathing, and that circumcision would largely prevent this, as it would prevent the water collecting under the prepuce.

Schistosomum Japonicum (*Tsuchiya*).[4]—The main signs of the disease produced by this fluke are enlargement of the liver and the spleen, with diarrhœa, anæmia, and ascites. The parasites are also found in dogs and cats in the endemic region (Yamanashi Province, Japan). The eggs of this fluke have no spine. The body of the male is not covered with papillæ. The length of the body and the diameter of the suckers are greater than those of *S. hæmatobium* (bilharzia). On the other hand, this fluke, like bilharzia, inhabits the portal vein and its affluents, but it lays its eggs solely in the intestinal wall; the eggs that cause the cirrhosis of the liver are carried there by the blood-stream. The onset of the malady is insidious, patients only seeking

advice when the disease is well advanced, when there exist enlarged liver, dilated stomach, epigastric pain, diarrhœa, dyspnœa, palpitation, epistaxis. The appetite is increased. The liver may reach to the umbilicus, becoming eventually nodular. In the last period there ensue ascites, hæmatemesis, melæna. Sometimes the disease commences with rigors and remittent or intermittent fever. In the diagnosis, Banti's disease must be considered; the finding of ova in the fæces is, however, diagnostic. Besides in Japan, the disease also occurs in China and in the Philippines. The treatment comprises change of locality and mild purges.

C. W. Daniels,[5] in a general discussion on lymphatic diseases in the tropics, mentions that in infections with *S. japonicum* the eggs may be found in the glands in immense numbers, that the glands are enlarged and more or less fibrotic, but that no obstructive lymphatic symptoms occur.

Goebel[6] gives a short summary of the pathological changes produced by infection with *Schistosomum hæmatobium* (bilharzia). The eggs, which alone are responsible for the lesions, get into the tissues by rupture of the capillaries, the first egg escaping from the summit of a wedge-like mass formed by the eggs in the rear. The eggs also escape into lymph spaces. The eggs, acting as foreign bodies, lead to inflammatory reaction, marked epithelial proliferation, epithelial crypts and nests analogous to the structures found in *Cystitis cystica*. The bilharzial tumours, e.g., of the bladder, are essentially granulation tumours consisting of proliferating submucosa with an epithelial covering arranged in more or less pronounced crypts and gland-like hollows. The adult worms exist in small veins or dilated lymph spaces in the subserous and intramuscular layers and in a very vascular layer between the submucosa and muscularis. Malignant new growth is the commonest occurrence in the bilharzial bladder. Carcinoma takes the form of carcinoma simplex, alveolare, or medullare, or cancroid. This is preceded generally by a condition of leukoplakia. In the rectal wall eggs are not deposited to the same extent as in the bladder. Adenomatous polypi are not uncommon. The author has not encountered malignant tumours. In the liver there occur cirrhotic foci around eggs. The frequency of calculi in Egypt is attributable to bilharzial catarrh of the bladder.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 31, 1908; [2]*Ibid.* Mar. 27, 1909; [3]*Lancet*, May 8, 1909; [4]*Sem. Méd.* Nov. 25, 1908; [5]*Brit. Med. Jour.* Oct. 31, 1908; [6]*Berl. klin. Woch.* July 5, 1909.

SCIATICA.

Purves Stewart, M.D., F.R.C.P.

The two most difficult and obstinate forms of neuralgia with which we meet in practice are tic douloureux and sciatica. The treatment of tic douloureux by deep injections of alcohol into the foramina of exit from the skull of the branches of the trigeminal nerve, as originally introduced by Schlösser, has yielded very satisfactory results. In last year's *Medical Annual* I described the technique, and more extended experience of the method by myself and others has confirmed

the opinion there expressed as to its undoubted value. Treatment by **Alcohol Injections** has also been advocated for sciatica, 1 to 2 cc. of 70 per cent alcohol being introduced at a time, and Schlösser records a number of obstinate cases cured by this means. But the sciatic being a mixed nerve, injections of alcohol into its substance necessarily tend to produce degeneration of the motor as well as of the sensory fibres. Hence it is not an uncommon sequela for the patient, although relieved of his sciatic pain, to have complete sciatic paralysis, both sensory and motor, as in cases recorded by Brissaud[1] and Fischler,[2] and as I have seen myself in an unpublished case of my own. True, the sciatic paralysis ultimately passes off as the nerve regenerates, but a long time may be required for this—as much as eighteen months in Fischler's case. We therefore prefer, if possible, to employ some other substance than alcohol for our injections.

The most satisfactory and innocuous injection is one of salt solution, as originally used by Lange, of Leipsic,[3] who employs **Normal Saline Solution,** either alone, or containing 0·1 per cent of **Beta Eucaine,** from 80 to 100 cc. of the saline being injected at a time. Schlesinger[4] employs normal saline solution cooled to a temperature of zero centigrade, the amount injected being much smaller, 10 to 20 cc. This, however, necessitates special refrigerating apparatus. Hecht,[5] of Chicago, records a series of 16 cases of sciatica treated by deep injections, 2 with alcohol, and the remainder with normal saline solution, either alone or containing beta eucaine. Of these 16 cases, 7 were pure sciatic neuralgia, 3 were associated with organic disease (secondary carcinomatous deposits, chronic parametritis, and diabetes), 1 had advanced arteriosclerosis, 2 were hysterical, 1 had incipient spondylitis deformans, and 1 arthritis of the hip. In the above series, Hecht's results were as follows: 7 patients were cured (3 after one injection, 1 after two injections, 2 after three, and 1 after five). The three cases associated with organic disease were only temporarily benefited. One of the hysterical patients was cured after a single injection, the other was made much worse. Two patients treated by alcohol injections, one of them an arteriosclerotic, were temporarily improved, whilst the spondylitic and the arthritic cases were unrelieved. To reach the nerve for the purpose of injection is not a matter of any real difficulty. Some observers attack it at a point midway between the ischial tuberosity and the great trochanter, the hip being slightly abducted. Hecht prefers to inject the nerve just after it emerges from the sciatic notch, making use of the spine of the ischium as the landmark. To find the ischial spine, a line is drawn from the sacro-coccygeal joint to the outer border of the great trochanter (*see Fig.* 83). The ischial spine is at the junction of the outer two-thirds with the inner third of this line. A thumb's breadth to the outer side of the ischial spine is the point where the sciatic nerve crosses the ischium. The nerve-trunk is reached at a depth of from 5 to 10 cms. from the skin, varying with the amount of adipose tissue and with the thickness of the gluteal muscles.

The patient lies upon his face with a flat pillow placed beneath the pelvis. The gluteal region is carefully cleansed and rendered aseptic. The bony points are marked out, e.g., with tincture of iodine, and the needle is plunged directly into the nerve-trunk. When the nerve is reached, the patient feels a sharp twinge of pain in the heel or back of the leg, less frequently at the knee or along the back of the thigh. The syringe is now attached to the needle, and the solution is slowly injected. The needle is quickly withdrawn and the puncture sealed with collodion and cotton wool. There is no danger of hæmorrhage if the needle is introduced as directed. In a few cases Hecht has

Fig. 83.—Hecht's diagram illustrating landmarks for reaching sciatic nerve at notch. The linear measurement in drawing is necessarily curvo-linear on the body. (*a*) Sacro-coccygeal joint. (*b*) Trochanteric border. (*s*) Spine of ischium. (*n*) Sciatic nerve a thumb's breadth to outer side of spine. Anatomical accuracy has been somewhat sacrificed to illustrate landmark.

noticed a slight pyrexia for one or perhaps two days, coming on about six hours after the injection. No other complication worthy of mention has been observed.

Some patients experience immediate relief from pain. In others the pain is aggravated for an hour or more, by a feeling of tension produced by the fluid. Some patients, whose pain radiates to the heel, experience relief only as far as the knee, the tender points in the calf still persisting. In such cases, Hecht gives an additional injection of 10 to 20 cc. into the peroneal nerve behind the head of the fibula. In the more severe cases requiring several injections, the patients should be kept in bed for about forty-eight hours. The injections may be repeated if necessary at intervals of from one to three days. No

objective sensory changes in the form of anæsthesia were found by Hecht to follow these injections, nor was motor paralysis produced.

Lange's results were as follows: Out of 56 cases, 13 were acute, 11 were subacute, and 32 were chronic. Of the 13 acute cases, 11 were cured, 1 was a complete failure, and 1 had a recurrence after six months. Of the 11 subacute cases, 7 were cured, 1 was uncured, 2 were improved, and 1 recurred in four weeks. Of the 32 chronic cases, 20 were cured, 4 were improved, 4 were uncured, and 4 recurred. Lange's total of 56 cases shows 15 per cent of failures, 10 per cent of recurrences, 10 per cent of improvements, and about 65 per cent of cures.

REFERENCES.—[1]*Rev. Neurolog.* 1907, p. 633; [2]*Münch. med. Woch.* Aug. 6, 1907; [3]*Ibid.* 1904, No. 52, and *Neurolog. Centr.* 1907, p. 423; [4]*Deut. med. Woch.* 1908, No. 6; [5]*Jour. Amer. Med. Assoc.* Feb. 6, 1909.

SEA-SICKNESS. *Purves Stewart, M.D., F.R.C.P.*

Each year a new remedy is offered to those who go down into the sea in ships, especially for short voyages, such as the Channel passage. Hoffmann,[1] of Mannheim, during a pleasure trip to the North Sea, made a trial of **Bromural** upon himself and a number of his fellow-passengers (he does not say how many), and with encouraging results. Whenever possible, bromural was taken before rough weather was expected, in a dose of two tablets (60 cgrams), followed by another tablet (30 cgrams) if the patient did not feel quite comfortable on reaching the open sea. Hoffmann states that even those who were bad sailors, if thus treated, generally escaped *mal-de-mer*, and those in whom nausea had already appeared were generally relieved by two or three tablets taken in a single dose. Only in one case was the patient rendered drowsy the next day. He therefore warmly recommends bromural as a useful drug, especially for short sea passages which do not last long enough for the patient to acquire his "sea-legs." Naturally, other circumstances must not be neglected, such as the choosing by the passenger of a position on the ship, not in the extreme bow or stern, but amidships. Entertaining conversation or reading also help to divert the patient's mind from otherwise threatening sea-sickness, and the recumbent position, in specially sensitive subjects, is also to be recommended.

REFERENCE.—[1]*Münch. med. Woch.* 1908, p. 2493.

SEVEN-DAY FEVER. *J. W. W. Stephens, M.D.*

L. Rogers[1] maintains that it is a distinct disease from dengue.

EPIDEMIOLOGY.—Dengue is an epidemic disease attacking the entire populations of large towns within the space of a few weeks or months, and spreading inland for thousands of miles. Seven-day fever is a sporadic disease confined to Indian ports. In dengue there is little tendency to the production of immunity, but an immunity is acquired in seven-day fever after the first, or second attack, this second attack occurring one or two years after the first, and not in the same season.

SYMPTOMS.—In dengue it is exceptional to get a rise of temperature after the second or third day, while in seven-day fever, a high continued

fever for seven days with a " typhoid " condition is frequent. Characteristic of dengue are the severe pains and their persistence for weeks or months after the temperature has fallen. In seven-day fever the pains are comparable to those of influenza. The temperature is of a continued type, with slight exacerbations at the beginning and the end. The slow pulse, 60, with a temperature of 102°, is noteworthy.

REFERENCE.—[1]*N.Y. Med. Jour.* July 3, 1909.

SKIN DISEASES, MUCOUS MEMBRANE LESIONS IN.

E. Graham Little, M.D., F.R.C.P.

Morris[1] opened a discussion on this subject at the Belfast Meeting of the British Medical Association in July, 1909. Mucous membrane lesions may be present associated with *drug eruptions*—as exemplified by the inflammation of the conjunctiva, throat, nose, and stomach, produced by *arsenic*; congestion of the throat may be caused by *iodides, salicylates, chloral,* and *belladonna*; stomatitis by *mercury*. The affections of the mucous membrane in *syphilis* are some of the most characteristic symptoms of that disease, and include the hard chancre, the soft sore, crescentic ulcers, mucous tubercles, and condylomata; syphilitic leucoplakia; the general congestion of the mucous membrane of the nose which is the cause of " snuffles." The mucous membranes are affected in a large proportion of cases of *lupus vulgaris*; the nose most frequently, the tongue, cheeks, palate, conjunctiva, lacrymal duct, and even the vagina and os uteri. *Leprosy* frequently commences in the mucous membrane of the pharynx and air-passages, and subsequently may be found on the conjunctiva, in the nose, the tongue, the larynx, and elsewhere on mucous surfaces.

The *erythemata*, of which erythema multiforme may be taken as the principal example, are often associated with early congestion of the pharynx, and later with bullous lesions of the mouth; in *urticaria*, the mucous membrane of the eyelids, lips, mouth, tongue, pharynx, and vulva may be the seat of wheals. In *pemphigus* and *dermatitis herpetiformis* the mucous membrane of the mouth, tongue, pharynx, intestine, larynx, trachea and bronchial tubes, vulva, and conjunctiva, may be attacked. *Epidermolysis bullosa, herpes febrilis, herpes zoster* may all show lesions of mucous membranes similar to those on the skin. In *psoriasis* and *eczema*, there are no definite lesions of the mucous membrane characteristic of these diseases, but in *eczema*, the mucous membrane contiguous to affected skin may become dry, fissured, and thicker than normal, with mucopurulent discharge. The condition known as " cheilitis exfoliativa "—exfoliativa of the lips—has been associated with seborrhœic eczema; and the mucous membrane of the genitals and lips has been recorded as showing changes in psoriasis. Involvement of the mucosa of the nose, lips, cheeks, conjunctiva, hard and soft palate, vulva, and larynx may be seen in *lupus erythematosus*; *lichen planus* quite commonly shows characteristic white patches on the mucous membrane of the mouth, and less frequently on that of the vulva. In *impetigo contagiosa, impetigo*

herpetiformis, and in *tinea*, the affection may extend to mucous membranes. *Sclerodermia, rhinoscleroma, acanthosis nigricans*, and *xanthoma* are rare diseases in which mucous membranes as well as skin may be the seat of disease.

TREATMENT of the mucous lesions will naturally be conditioned by the nature of the diseases of which these lesions are symptoms. As a general rule, it may be said that **Caustics** should not be employed, in syphilitic patches a 5 per cent solution of **Chromic Acid** is very useful. **Radium** will probably offer a valuable resource for pre-cancerous and malignant diseases of the mucosa.

REFERENCE.—[1]*Brit. Med. Jour.* Aug. 28, 1909.

SKIN DISEASES, THERAPEUTICS OF.

E. Graham Little, M.D., F.R.C.P.

Anthrasol.—Howard Fox[1] has tried the comparative efficiency of anthrasol and other older tar remedies, chiefly oil of cade. In twenty-five experiments with cases of *eczema*, subacute and chronic, anthrasol and oil of cade was tested in equal strengths of ointment or lotion, one side of the body being treated with anthrasol, the other with oil of cade ; in any instance where there was inequality of severity of disease, anthrasol was used on the less severe side. The result of the observation was to decidedly favour the older preparations.

Arsenic.—The position of arsenic in cutaneous therapeutics is at the present time a curiously shifting one. Hartzell[2] reviews the history of its introduction and use, and gives his opinion on its exhibition in the following diseases :—

Eczema.—In acute conditions generally, arsenic is supposed to be injurious, and it should not be used in acute eczema. It is probably nearly useless in the chronic forms as well.

Psoriasis.—It has its widest application in recent cases ; but not while in acute eruption, or when the disease is very hyperæmic. It remains a very useful drug, but must not be used indiscriminately.

Lichen Planus.—Hartzell would place arsenic in the front rank of remedies for this disease, especially in eruptions of limited area. Where there is much pruritus he substitutes salicylates.

Pemphigus and *Dermatitis Herpetiformis.*—Arsenic here holds its own as the most efficacious remedy, but it appears rather to inhibit the eruption than to cure the disease.

Sarcoma of Skin.—Arsenic, given hypodermically, appears to act very well in this disease, and should always be given a trial.

Mycosis Fungoides.—Its use here is of uncertain effect. Of the newer compounds of arsenic, Hartzell has tried **Sodium Cacodylate,** but found no advantage in its use over older forms of the drug. **Atoxyl** in Hartzell's hands has given the disappointing results which recent users of the drug are reporting with increasing frequency. Owing to its greater solubility, it is well adapted for hypodermic use, but it possesses no other advantages over the older varieties—arsenious acid, Fowler's solution, and arseniate of soda.

Freezing.—Jackson and Hubbard[3] describe in great detail the method of using liquid air devised by Dr. Campbell White in 1899, and carbonic acid gas as used by Dr. Pusey. The latter is probably the safer, and certainly the more convenient, method, since the carbonic acid cylinders can be more readily obtained and much more easily kept. In the case of liquid air, the fluid is supplied in Dewar's bulbs, and is applied on wool wrapped round a stick and dipped into the fluid; the swab, thus wet, is pressed against the lesions to be treated, with varying degrees of pressure and duration, according to the nature and depth of the disease.

The carbonic acid gas is supplied in cylinders. The cylinders should be mounted in a rack, with the valve end downwards at an angle of 45°. The cap covering the vent-hole is removed, and the vent covered with some porous material, e.g., chamois leather as used by Pusey, or cotton-wool as in Hubbard's apparatus. The latter is essentially a tube of brass of a size to fit the hole, which is covered with cotton-wool; the snow is collected in the tube and pressed down with a plunger. For small lesions, ear specula are excellent contrivances to collect the snow in; this can be safely manipulated if the hands are covered with gloves or chamois leather. The snow must be applied with moderate pressure on the part for a period of from ten to sixty seconds; rarely, however, will an exposure of more than thirty seconds be required; the duration will be roughly proportional to the superficiality of the lesion. The part treated is frozen stiff; on thawing there will be a zone of redness about it, and vesicles appear on it; a slight crust forms later, and the scar is left particularly supple and of good appearance. The only really painful part of the process is the period of thawing, the pain of which may be mitigated by the application of cold water.

This method has been used by the writer for a long time, and has given excellent results in *lupus erythematosus*, *nævi* (especially pigmentary and hairy nævi), *epitheliomata* (especially of the rodent ulcer type), *keratosis senilis*, *warts*, *papillomata*, *tattoo-marks*, *hypertrophied scars*, *keloid*, *tuberculosis verrucosa cutis*, *chloasma*, and *scrofuloderma*.

Vaccine Therapy.—(*See also* Acne Vulgaris.) Varney[4] has found encouraging results with vaccine therapy in the following diseases: *Furunculosis*, *carbuncle*, *impetigo contagiosa*, *sycosis staphylogenes*, *pustular acne*. Opsonic estimation may be dispensed with in re-inoculation; his experience has shown that "inoculations of a polyvalent stock suspension made at intervals indicated by clinical symptoms, produce as good results as when controlled by opsonic indices." Several strains (staphylococcus) should be included in the stock suspension. Injections for the first three doses should be given at intervals of six days, beginning with 100 to 150 million for the first, 200 to 250 million for the second, 300 to 400 million for the third. The dose will rarely have to exceed 600 million. Patients must be instructed not to undergo any fatigue or excess in the period corresponding to the negative phase after the inoculations.

G. W. Davis[5] records a personal experience of a successful use of a stock staphylococcus vaccine in an intractable *pustular eczema* of the beard and auditory meatus. Injections were given every four days, beginning with 10 million and gradually increased to 500 million, with complete cure in three weeks.

References.—[1]*Jour. Cutan. Dis.* May, 1909, p. 192; [2]*Jour. Amer. Med. Assoc.* Oct. 31, 1908; [3]*Med. Rec.* Apr. 17, 1909; [4]*Jour. Amer. Med. Assoc.* Aug. 28, 1909; [5]*Lancet*, Sept. 25, 1909.

SLEEPING SICKNESS. (*See* Trypanosomiasis.)

SMALL-POX. *E. W. Goodall, M.D.*

Clinical Facts.—A very full account of the prodromal rashes of small-pox will be found in a paper by R. S. Thomson and J. Brownlee.[1] Their classification of these rashes is as follows:—

1. General Erythemata.

(*a*). *Scarlatiniform.*—This is probably the most common of the initial rashes. It presents itself as a more or less uniform erythema covering the whole body, including the face. The rash consists of minute macules the size of a small pin's head, closely set together. Between the macules the skin has a paler red tint. Though often uniformly distributed, the continuity of the rash may be interrupted by patches of skin quite free from rash. This rash comes out first on the back, chest, and arms. Frequently it is evanescent; but in cases where the proper eruption of small-pox is scanty, it may persist for several days. It is most commonly seen in cases modified by vaccination; of 69 vaccinated persons who presented this initial rash, in 6 the eruption of pocks became confluent, and one of these cases was fatal. The majority of the others suffered from a mild attack. But when the rash is observed in unvaccinated persons, a graver prognosis must be given; of four such cases, two died.

(*b*). *Morbilliform.*—When this variety is fully developed, it consists of erythematous patches varying in size from that of a millet seed to that of a split pea, or larger. In its earliest stage the rash is made up of minute red points separated by skin of a paler hue. Later the points coalesce in groups to form irregular patches, so that the appearance closely resembles the rash of measles. In a very few instances the erythematous patches are somewhat raised. The distribution is universal over the trunk, limbs, and face. The intensity of the colour of the rash varies considerably.

According to the experience of the Glasgow Hospital, where the authors studied them, the morbilliform rashes are not commonly seen in cases where the true eruption becomes confluent or semi-confluent; so that they usually presage a mild attack. Of twenty-five persons who presented this form of initial erythema, two suffered from a confluent attack, from which they recovered. The rash was seen in one unvaccinated child, aged 3 years, who suffered from a mild attack of discrete small-pox.

(*c*). *Erysipelatous or Astacoid.*—This is very rarely generalized in distribution. For a description of it, see 2 (*c*) below.

(*d*). *Livid Erythemata.*—This eruption consists of a "deep erythema, interrupted by broad streaks and bands of purple, the combination imparting a dark plum colour to the skin." The authors saw this rash only in unvaccinated persons. It affects the trunk and limbs but not the face. It is possibly an exaggeration of the astacoid variety. All the cases in which it occurred were fatal during the first week of illness.

(*e*). *Urticaria.*—This form of erythema was not observed by the authors as an initial small-pox eruption. It has been described by other writers.

All the forms of erythema so far described disappear on pressure, leaving, however, a yellowish staining. In the astacoid and the livid erythematous varieties the staining is of a deep gamboge yellow.

2. Local Erythemata.

(*a*). *Pale Simple Erythemata.*—Of these there are two varieties, the roseolar and the morbilliform. They affect especially the lower part of the abdomen, groins, and flanks, occasionally extending to the axillæ. But their distribution may be even more local, to the axillæ, forearms, or legs. These areas of distribution may be combined in a variety of ways.

(*b*). *Capnitoid* (καπνός, *smoke*) *Erythemata.*—The authors state that this form of initial rash has never previously been described. The rash has "a somewhat pale or sepia tint, the affected skin being slightly darker or more livid than that in the neighbourhood. It varies considerably in intensity, being at times quite distinct, while in other cases it is detected only on the closest scrutiny and in a subdued light." It disappears on pressure, leaving behind a yellowish staining. It is very evanescent and may easily be overlooked. It is limited to the lower part of the abdomen and upper part of the thigh. It is met with mostly in vaccinated persons. Its occurrence warrants a favourable prognosis.

(*c*). *Erysipelatoid or Astacoid* (ἀστακός, *a lobster*) *Erythemata.*—When it first comes out, this rash consists of innumerable small, red points, of the size of a small pin's head, though they may be larger. These points become confluent to form a deep lobster-red erythema. The margin of the affected area is broken up by bands and areas of normal skin, and outlying small spots, of a size up to that of a split pea, are seen. Occasionally, however, the edge of the erythematous area is abrupt, and this is especially the case when the rash affects the lower part of the abdomen and adjacent parts of the thighs. The rash fades on pressure, leaving a uniform yellow staining or a number of small brownish-yellow spots, like freckles. The erythematous portion of the skin is markedly raised above the neighbouring healthy skin. This swelling of the rash is most marked when it occurs upon the hands and feet. Occasionally a few small petechiæ are found upon the erythematous area. The most frequent locality of the rash is the

lower part of the abdomen and upper part of the thighs; but it may extend on to the flanks and even up to the axillæ. The occurrence of this rash warrants a very grave prognosis. Usually it ushers in an attack of confluent or of hæmorrhagic small-pox.

3. "Petechioid" Eruption.

This rash consists of numerous macules varying in size from a small pin's head to that of a hemp-seed. Their colour varies in different cases, and even in the same case. Usually they are yellowish or yellowish-brown, but frequently the larger ones present a faint violet tint. They do not quite disappear on pressure, but leave behind faint greenish-yellow points in their centres. They are not, therefore, true hæmorrhages due to ruptured blood-vessels. This rash commonly appears on the second day, and the process of its development may occupy several days. The favourite situation is the lower part of the abdomen and the upper and inner parts of the thighs; but the flanks and axillæ may be invaded. This rash may be associated with a more or less vivid erythema (the "petechio-erythematous" rash of other writers).

When this rash consists of deep red or purplish spots, and especially when associated with the astacoid erythema, the prognosis is grave. Otherwise it is by no means so.

4. Petechial Eruptions.

These consist of true hæmorrhagic spots varying in size from a split pea downwards. The spots do not all come out simultaneously, but the whole rash occupies several days in development. The distribution is very irregular over the trunk and limbs, and the number varies from two or three up to many hundreds. Occasionally the spots are limited to the abdomino-crural region mentioned as being the seat of election of some of the previously described rashes. Usually the prognosis is serious.

5. Vesicular Eruptions.

Occasionally a number of minute vesicles are found associated with the petechioid rash already mentioned.

6. Bullous Eruptions.

Very exceptionally an initial rash may consist of a sparse eruption of bullæ varying in size from a large pea to a hazel-nut. The distribution is limited to the face and neck. According to the authors, the bullæ are filled with an opalescent fluid which yields an abundant growth of *Staphylococcus aureus*.

7. Composite Prodromal Rashes.

Most of the rashes described above may be combined with one another.

Period of Occurrence.—Most of these rashes appear at the end of the first and during the second day of the illness.

Age of Prevalence.—These initial rashes are met with most commonly in persons between puberty and middle life. In childhood they are as a rule rare, " but occasionally one of the prodromal varieties of erythema (scarlatiniform, morbilliform, or capnitoid) may be found even in very young children." The erysipelatoid, " petechioid," and petechial forms occur most commonly after the age of thirty.

The authors give a very full review of the literature of the subject; and the paper is accompanied by several excellent coloured illustrations of the rashes described.

Diagnosis.—Rickets and Byles[2] lay great stress on the distribution of the proper eruption in the diagnosis of small-pox, and on the influence of irritation of all kinds on the distribution. They give very many examples in their work, which is admirably illustrated.

An instance of the disastrous results that may attend an error in diagnosis of this disease is given by D. S. Davies,[3] Medical Officer of Health of Bristol, in an account of an epidemic which occurred in that city and its neighbourhood at the end of 1908 and the beginning of 1909. A man, J. S. R., was taken ill about Feb. 12th at a village called Wick, in the Chipping Sodbury Rural District of Gloucestershire. His illness was diagnosed as being purpura, and he was removed in an ambulance to a general hospital in Bristol on Feb. 15th. He died in an isolation ward in that institution the next day, and after a post-mortem examination had been made, the death was returned as one of acute nephritis. Beyond the placing of the man in the isolation room, no precautions appear to have been taken against the spread of infection. The case of J. S. R. was responsible, directly or indirectly, for no fewer than twenty-five other cases.

[The case of J. S. R. was undoubtedly one of hæmorrhagic small-pox (variola nigra). In this form of the disease the patient may die before the proper eruption of small-pox makes its appearance. The most obvious and striking symptoms are the hæmorrhages, and hence the diagnosis of purpura. Some years ago, in London, a medical man was summoned by a municipal authority for failing to notify a case of small-pox. His defence, which was successful, was that he did not know the case was one of small-pox, and that he believed that he was dealing with a case of purpura hæmorrhagica. This form of small-pox is prone to be extremely infectious; and as in the Gloucestershire case, the one to which I have just alluded gave rise to several others. But it cannot too strongly be impressed upon medical men that a case of acute purpura in which the symptoms take only a few days to develop should be regarded with suspicion from the point of view of small-pox, especially if small-pox should happen to be prevalent in or about the locality. In the Gloucestershire case there had been a few cases in Bristol and the neighbourhood during the month of January. Purpura hæmorrhagica is seldom so rapidly fatal as hæmorrhagic small-pox.—E. W. G.]

Davies records two other interesting cases (from the point of view of diagnosis) in connection with the case of J. S. R. A charwoman,

a clerk, a kitchenmaid, and a wardmaid, who had all been brought into contact more or less close with the patient J. S. R., contracted from him definite small-pox. "Towards the end of February two nurses, Sister W. and Nurse R., who had been revaccinated in 1908, had developed . . . a train of symptoms—fever, headache, etc., lasting two days—which might do duty either for influenza or for the 'initial fever' of small-pox. No papules developed, they recovered perfectly, and Nurse R. immediately returned to duty in the ward on or about Feb. 28th. Twelve days afterwards, on March 16th, a patient in her ward developed small-pox, and was removed to hospital, where she died. She must have contracted the infection about Feb. 28th." Davies suggests that Sister W. and Nurse R. suffered from abortive attacks of small-pox; and that it was from Nurse R. that the patient in her ward caught the disease. This is not unlikely. Certainly persons can have small-pox modified to such a degree, or perhaps it should be rather said in such a way, that after the initial fever and other symptoms, their illness comes to an end without any eruption. Sydenham was acquainted with this form of the disease, and called it "variolous fever." But, as probably occurred in Nurse R.'s case, the illness, being really small-pox, may give rise to unmodified attacks in susceptible people. It should be noted that though now-a-days modified small-pox of the variety that is now being discussed is almost entirely limited to persons who have been vaccinated, it may occur, as in Sydenham's time, in persons who have not had small-pox and who have not been vaccinated.

In connection with the case of Nurse R., the following case, also reported by D. S. Davies,[1] is of much interest. We give the clinical account of the case at length: "On Thursday, March 18th, 1909, S. C., a girl, aged 16, living in domestic service in Bristol, complained of a slight sore throat and some headache; she was well enough to 'go out' on Sunday, March 21st, as usual, but apparently got worse later, and Dr. Myles was called in to see her on March 25th. He found that she then had a temperature of 102° F.; the tongue was furred, the throat and palate injected, and she complained of pain in the back. She also presented a profuse, soft, papular rash, distributed somewhat generally over the body, most marked on the front and outer side of the upper arm, and on the thighs, less profuse on the trunk, very few papules on face and forehead, and none on the wrists. The papules were flat and of a dark copper colour; some quite large patches of slightly raised areas occurred, especially on the upper arm, covering the area of a shilling or half a crown. On palpation the papules and raised areas were softish, and gave the impression of being quite superficial, with the exception of a few on the forearm, which felt more rounded, somewhat deeper in the skin, and more resistant. The eruption on the palate and tonsils was distinctly not papular. The left arm showed two small scars of primary vaccination. Although the case presented the appearances of a papular erythema accompanied by fever, and not any characteristic appearances of modified or minimal

small-pox, she was admitted, as a precautionary measure, to an isolation ward in the city hospitals on March 26th for observation, under the care of Dr. Pauli. On admission the appearances presented were practically unaltered, though the papules showed no signs of development and had become less prominent; the temperature on March 26th ranged from 100·4° F. at 10 a.m. to 102·6° F. at 6 p.m. On March 27th Dr. Pauli noted that the patient presented in the situations named a deep-coloured or dusky erythematous rash, but the raised condition of the skin had subsided, and no papules could be distinguished. The tongue presented the dirty brown appearance often associated with gastric disturbance. On this day the temperature fell rapidly and evenly from 101·8° F. at 2 a.m. to 99·6° F. at 10 a.m., and to 99·0° F. at 6 p.m. Under simple treatment the tongue very quickly cleaned; the temperature fell to normal by the morning of March 28th, and continued normal; at no time was there the slightest indication of vesiculation over any of the spots or patches, nor did the most careful examination disclose the presence of a single papule which suggested even the most modified or abortive form of the true small-pox papule; the erythema faded quickly, leaving discoloured patches of skin, over which a slight branny desquamation occurred."

The girl's illness was diagnosed as acute febrile erythema. She remained in hospital a week, and went on April 1st to her home in Somerset. There she remained till April 14th, when she returned to service in Bristol. On April 21st her brother, and on April 23rd her father, fell ill with small-pox; the latter had the disease in its hæmorrhagic form, and died. It is clear from our knowledge of the incubation period of small-pox, that these men must have contracted the disease on or about April 9th and 11th, during which period the girl, S. C., was at home. There was no case of small-pox in the town in which her home was situated. But there had been scattered cases in adjoining parts of the county during March and April. On April 24th the patient, S. C., was again examined by Dr. Myles, who found discoloration persisting on the spots and patches where the rash had been. She was unsuccessfully revaccinated on April 24th. On her return to Bristol she slept with another servant girl who had been vaccinated in infancy and not since. This person was revaccinated on May 3rd, and the revaccination took successfully in two places.

Davies discusses the question whether or not S. C. suffered from abortive small-pox. Certainly the case is very suggestive; though it was impossible to prove its exact nature, chiefly because it was impossible to exclude absolutely other sources of infection for the cases of her brother and father. Again, the onset of S. C.'s illness was not so sudden and definite as is usual in small-pox, "nor were the course of the temperature nor the appearance, distribution, and development of the rash at all characteristic of modified, minimal, or abortive small-pox."

TREATMENT.—Captain V. B. Nesfield,[5] I.M.S., treated eight cases of smallpox with **Mercury.** He gave 10 gr. of hydrarg. cum creta

three times a day for six days ; then twice a day for four days ; and once a day for four days longer ; fourteen days in all. These doses were for adults ; half was given for a child. He states that the cases did remarkably well under this treatment, so that he would try it again in other cases. No ill effects were produced. The patients were natives of India ; five of them had not been vaccinated.

REFERENCES.—[1]*Quart. Jour. Med.* Jan. 1909 ; [2]*The Diagnosis of Small-pox*, 1908 ; [3]*Brist. Med.-Chir. Jour.* June, 1909 ; [4]*Brit. Med. Jour.* Sept. 18, 1909 ; [5]*Ind. Med. Gaz.* Oct. 1908.

SPERMATIC CORD, TUMOURS OF. *Priestley Leech, M.D., F.R.C.S.* Patel and Chalier,[1] of Lyons, have collected many reported cases. They confined themselves to the primary neoplasm of the cord. They classify the tumours of the spermatic cord on an anatomical basis into six categories : (1) *Lipomata ;* (2) *Fibromata ;* (3) *Myomata ;* (4) *Sarcomata* and *fibrosarcomata ;* (5) *Mixed tumours ;* (6) *Carcinomata.* In some of the cases the tumours might have been classified as fibrolipomata, fibromyomata, etc., but this would have led to a needless multiplication of the groups. In order of their frequency they are arranged as follows : (1) Lipomata, 37 cases ; (2) Sarcomata and fibrosarcomata, 22 cases ; (3) Mixed tumours, 13 cases ; (4) Fibromata, 12 cases ; (5) Myomata, 4 cases ; (6) Carcinomata, 1 case. The lipomata are most frequently seen between 40 and 60 years of age, and even later ; only once or twice have they been found in young people. Fibromata have been reported at all ages between 18 and 69, and most frequently about 50. Sarcomata and mixed tumours occur both in children and adolescents, but the greater number have been seen after 40 ; the only case of primary carcinoma of the cord was seen in a man of 42 years of age.

1. *Lipomata* are generally single, isolated, and unilateral ; there is no marked preference for the right or left side. Their size varies from that of a nut to a child's or adult's head, or even larger. Stori removed one of 8,900 grams, and Wilson one of 20 lb. (9071·8 grams). Generally a lipoma is single, encapsulated, with a fairly regular outline ; in many cases it seems to be composed of several fatty masses of varied sizes. Sometimes it takes the form of an elongated mass. The consistence may be semi-fluctuant, or there may be harder portions, depending on the amount of fibrous tissue mixed with the fatty lobules. In some cases the fibrous tissue may predominate, forming a fibrolipoma. Myxomatous tissue may be found in these tumours, and this is a step towards malignancy. Finally some believe that a lipoma may develop into a sarcoma. In most cases it is easily isolated from the elements of the cord, and does not adhere to the skin. It may push the testicle and epididymis aside, or it may envelope them so that it is difficult to find them, and they may be so bound down to the tumour by fibrous strands that it is almost impossible to separate them. The cord may be stretched by the weight of the tumour, which may be in the inguinal canal or outside it. A distinction should be drawn between hernial lipomata, lipomata arising from the peritoneum or pre-

peritoneal tissue, and those (primary lipomata of the spermatic cord) arising from the interior of the cord itself. However, it is not always easy to draw a rigorous line of demarcation between true and false lipomata of the cord, as it is impossible in large tumours to discover the point of origin. The authors divide them into three classes: (*a*) Intra-scrotal, (*b*) intra-inguinal, (*c*) inguino-scrotal. The larger tumours may extend into the pelvis.

2. *Fibromata* are rare; their size varies; the largest removed by M. Villard weighed 15 kilos. They may be divided into three classes, according to their primary situation: (*a*) Inferior or peri-epididymoid fibromata, (*b*) upper or inguinal fibromata, (*c*) middle or funicular fibromata. Macroscopically the fibromata are hard, smooth, and regular; sometimes, however, they may show knobs, which may become pedunculated. Of a whitish colour, they are clearly defined, surrounded by a thick fibrous capsule, which is often very little adherent. In all the reported cases the testicle and epididymis have been found healthy; generally they are distinct from the tumour, but they may be more or less adherent, or may be surrounded by it. A small vaginal hydrocele is sometimes present, and the cord above the tumour is generally increased in size, and may be lengthened. On section it creaks under the scalpel and reminds one of the appearance of a uterine fibroid; pearly white tissue formed by concentric fibres between which are darker coloured fibres, and several small cavities with puriform contents may be seen. Microscopically fibres and connective tissue cells are seen, with blood-vessels, lymphatic vessels, and dilated capillaries.

3. *Myomata and Fibromyomata* may arise from the epididymis, or from the cord, and it is sometimes difficult to distinguish between the two. They are rare, and vary in size from that of a nut to an orange; surface smooth and rounded, and generally hard, though there may be softer points. The tumour is adherent to the epididymis or the vas deferens, but never to the skin. The testicle is healthy, but the tumour may be adherent to the tunica albuginea; sometimes to the tunica vaginalis, and often there is a hydrocele, which may be sanguineous and even contain blood-clots. In a case observed by the authors the tumour was a *malignant leiomyoma*; this form is rare, and is often mistaken for fusocellular sarcoma or a fibroplastic tumour. These malignant leiomyomata may give rise to multiple visceral metastases. They arise either from the epididymis or the vas deferens.

4. *Sarcomata.*—This group is the most important one next to the lipomata. They are generally situated on the left side, and although more commonly met with at the lower end of the cord they occur at the superior end and may extend into the iliac fossa. Their size and form vary, and the testicle and epididymis may be quite distinct from the tumour, or be surrounded by it. The cord is generally not thickened; the skin can be moved over the tumour, but it is often red and marbled with dilated venules. No enlargement of the inguinal

or iliac glands was found. Calcareous points or softened portions may be found on section; in other cases more or less voluminous cysts. Histologically the sarcomata of the cord often belong to the group of fasciculated sarcomata; others are giant-celled sarcomata; exceptionally round-celled sarcomata.

Mixed Tumours and Teratomata of the Spermatic Cord.—These belong to the connective-tissue type; none to the epithelial group. In rare cases myxolipomata and myxofibromata have been found, but in the majority the sarcomatous element is the most constant, and with this may be allied fatty, mucous, fibrous, and cartilaginous elements in various proportions; in one case bony tissue was found in the tumour. It is difficult to ascertain the point of origin of these tumours, but the authors think they arise from embryonic remains, as the vas aberrans of Haller, etc.

The evolution of tumours of the cord is generally slow and painless, and the patient only complains of the weight and size. The sarcomata and the malignant leiomyomata develop more rapidly, and a case of the latter arose within two months. The inguinal glands are not enlarged. In other cases a tumour of slow growth may take on very rapid development, and this occurs more particularly in the mixed tumours, and is due in most cases to the supervention of malignant growth. The skin rarely becomes ulcerated, even in advanced cases of malignant tumours of the cord. The diagnosis has to be made from growths of the testicle and inguinal canal, cysts of the cord, inflammation (traumatic, specific, gonorrhœal and tuberculous), hydrocele, epiplocele, or irreducible hernia. In the cases where the tumour is intra-inguinal a differential diagnosis is sometimes impossible unless an operation be performed. (A bibliography, with notes of the cases hitherto observed, is included in the paper.)

REFERENCE.—[1]*Rev. de Chir.* Jan. to Aug. 1909.

SPINE, SURGERY OF THE. *K. W. Monsarrat, F.R.C.S.*

The most important contributions to spinal surgery during the past year, concern the treatment by operation of *chronic spinal meningitis.* Sir Victor Horsley[1] contributes a clinical lecture on the differential diagnosis and surgical treatment of this condition, based on the records of twenty-one cases operated on. The symptoms resemble those of tumour of the cord in so far as the history is that of pain and progressive loss of power in the legs, with perhaps slight kyphotic curvature of the spine; the condition ultimately developing into a progressive paraplegia that runs through the ordinary course and terminates fatally. The first point to which attention was drawn was the character of the pain; in spinal tumour the pain is usually localized to one nerve root, in chronic spinal meningitis the pain is referred to diffuse areas supplied from several roots. The symptoms in these cases, as in tumour, show a certain degree of unilaterality, and this sign is not to be relied upon in diagnosis between the two conditions. Pain is felt in one limb to begin with, and then it spreads to the other limb,

and then up the back. A diffuse area of hyperæsthesia is a characteristic of meningitis rather than tumour, in which at the outset there would be either a marked zone of hyperæsthesia at the upper limit of the anæsthesia or a similar area corresponding to the nerve root or roots on which the tumour is situated. With regard to paralysis, the patient first has a gradual sense of weakness in the whole leg, and in this respect the onset resembles that of the paraplegia which occurs in tuberculous caries. There is sometimes a localized extra weakness of one joint, but no restricted root paralysis. The gradual weakness develops, until at last the patient cannot stand. Secretion is proportionately paralysed with the advance of the paraplegia, but there are no vasomotor phenomena (unlike a bad case of compression paraplegia from caries or tumour), and these patients show no tendency to trophic disturbance. With regard to the region of the cord affected, in the majority of the twenty-one cases referred to, the mischief apparently began all over the lower half of the back of the cord. Whether it commences in the lower part and gradually extends upwards, or whether the process is simultaneous in the lumbar and dorsal regions, will probably not be found out for some time. All the patients, with one exception, were adults.

With regard to the etiology of the condition, some were certainly syphilitic, others apparently not. Traumatism does not appear to be a causative factor ; on the other hand, there was evidence in support of the proposition that the meningitis in some of the cases was gonorrhœal. Infection with gonorrhœa had occurred in several cases a relatively short time before the occurrence of the spinal symptoms, and in the absence of other infections.

The treatment consisted of simple laminectomy, opening the theca, and washing it out with a mercurial lotion. The theca is not to be sewn up. After the wound is completely healed, free mercurial inunction of the spine should be ordered, especially over the scar, with the idea that, having arrested the disease, an attempt should be made to secure active " absorption " and a complete restoration to health. Probably many cases of so-called acute myelitis are really meningeal in origin, and laminectomy and opening the subdural space might arrest the whole process and the subsequent fatal injury which the cord sustains in such conditions.

In a paper read before the College of Physicians of Philadelphia, Spiller[2] drew attention to a condition which appears to be at least closely related to that considered by Sir Victor Horsley, and which he terms circumscribed serous spinal meningitis. The gross anatomy of the lesion is a collection of clear fluid in a cyst of the spinal pia-arachnoid. He states that the symptoms are those of circumscribed compression of the spinal cord, and that operation is easy and cure seems to be permanent in typical cases. In the case reported in 1903, when the dura was opened the much swollen arachnoid protruded through the dura, and appeared violet-blue in colour. A similar condition was found by Mendel and Adler, and in their case the

arachnoid was punctured and about a teaspoonful of clear fluid escaped in a strong stream. The improvement after operation was very marked. Spiller's patient also, who was operated on by Martin, lost all her symptoms, with the exception of slight pain in one buttock when the operation scar was pressed upon. Spiller refers shortly to the literature of the subject, which is scanty; Krause, in operating on twenty-two cases of spinal compression expecting to find tumour, found circumscribed serous meningitis in six.

There appear to be some differences between the cases grouped by Spiller under the above quoted title and those related by Horsley, in particular, regarding the extent of the lesion, which in Horsley's patients was diffused over the lower half of the cord and cauda, whereas in Spiller's collected cases the lesion was of the nature of a strictly circumscribed collection of fluid in the pia-arachnoid. The latter appear to correspond with Oppenheim's "arachnitis sero-fibrinosa circumscripta," the former with the type described by this author as "meningitis spinalis serosa." Both groups are alike, however, in that the lesion was meningeal, simulated tumour, and was remediable by operation.

One of Krause's cases is again referred to in a paper published by himself and Oppenheim.[3] The lesion was cervical; the laminæ of the 2nd, 3rd and 4th cervical vertebræ were resected, the dura opened, and a meningitis serosa found. This had followed an injury, and severe symptoms of compression of the cord had been present for many months. Recovery followed the operation, and two years later the patient was free of all symptoms of his lesion. This appears to be the first case of the kind operated on. This paper is, however, primarily concerned with the account of two successful cases of operation for *tumour of the spine in the cervical region*. The first was that of a man aged 29, who had presented symptoms for two years, the diagnosis before operation being an extra-medullary compressing lesion affecting the region from the 6th cervical to the 1st dorsal segments. An intradural tumour was removed, which proved on examination to be a fibroma. Recovery followed. The second case, a medical student aged 23, presented symptoms of a tumour in the middle and lower cervical regions, the upper limit reaching the 5th segment. A tumour was removed by Krause, its upper limit being at the level of the 4th arch. Two and a half months later the symptoms had for the most part disappeared. A third case, but in this instance an extradural enchondroma, is also related in the paper. The tumour was at the level of the 6th and 7th cervical vertebræ, and was removed. The dura was torn in the process of removal. Cerebrospinal fluid leaked from the wound, and death took place on the eighth day. The post-mortem revealed no inflammatory reaction in the wound, the bladder showed diphtheritic cystitis, and the right kidney was in a condition of pyelitis.

REFERENCES.—[1]*Brit. Med. Jour.* Feb. 27, 1909; [2]*Amer. Jour. Med. Sci.* Jan. 1909; [3]*Münch. med. Woch.* May 11, 25, and June 1, 1909.

SPIROCHÆTOSIS. *J. W. W. Stephens, M.D.*

R. M. Carter[1] records the occurrence of spirochætosis in man in the Mudariba district, S. Arabia, where also a species of *Ornithodorus* was present. The symptoms noted were enormous œdema at the site of the tick-bite, headache, boneache, intense prostration, lack of mental activity, enlarged spleen, terminal copious green diarrhœa. The infection of the blood with spirochætes was a heavy one. The author figures a number of peculiar forms seen by him in the blood of inoculated bush-tailed rats, and uses a still more peculiar terminology in describing these forms.

A discussion on the etiology of *tick fever* (Rocky Mountain) is reported in the *Journal of the American Medical Association*, Nov. 21st, 1908.

Incubation Period—5 to 7 days.

Symptoms.—Malaise and chilly feelings are accompanied by stiffness and soreness all over the body, especially in the back and legs. Tongue dry and cracked in the middle, moist at the edges. Constipation, usually obstinate. Fever continuous, ranging from 100 to 105° F. Eruption appears in three to five days on the back, ankles, wrists, limbs, body, palms, soles, usually in this order; later in the mouth and throat. The rash consists of maculæ, at first red, then dark, hæmorrhagic, blotchy, and extensive. Delirium is frequent. Pulse is slow and full, urine scanty (sometimes suppression), high coloured, occasionally hæmaturia, rarely albuminuria. The hæmoglobin may fall to 50 per cent. The mortality is 5 to 10 per cent.

Complications.—Pneumonia, nephritis, cardiac weakness, meningeal irritation, and gangrene of skin.

Etiology.—The disease can be transmitted to animals, and it is thought that in the states where this fever occurs the following animals may have the disease naturally, viz., sheep, sheep-dog, horse, jack rabbit, gopher, ground squirrel, chipmunk, coyote, or badger. The disease is one that affects people who have to do with sheep (38 per cent of Idaho cases), although in Montana the disease occurs in the western side of the state where sheep are not kept. Moreover, the disease is almost certainly a tick-borne disease, for in Idaho there is a history of tick-bite in about 80 per cent of cases; and the disease can be transmitted from animal to animal by ticks. With regard to the ticks concerned, the Montana tick is *Dermacentor andersoni*, the Idaho tick is probably a new species of *Dermacentor*, while the California tick is *D. occidentalis*. The majority of cases of tick fever occur in April and May, rarely after August. The tick season is also the early spring. They are rarely found in Montana after July 1st and until February.

The hæmatozoon described in the *Medical Annual*, 1905, has not been confirmed.

F. P. Mackie[2] gives an interesting summary of our knowledge of the pathogenic spirochætes in man. The following table is somewhat altered from his original :—

	Sp. recurrentis. European.	*Sp. duttoni.* Congo.	*Sp. novyi.* American.	*Sp. carteri.* Bombay.
Average length ...	20 μ	24 μ	17 μ	26 to 32μ
Undulations ...	6 to 8. 2 μ broad	8 to 10. 2·2 μ broad	6 to 8. 1·9 μ broad	
Course of disease in man	One, sometimes two, relapses	Severe. Four or five relapses	?	Severe. One or two relapses
Parasites in blood	Abundant	Scanty	?	Variable
Susceptible animals	Small rodents only after passage through monkeys	All the ordinary laboratory animals except cats	Small rodents very susceptible	Small rodents infected with difficulty
Mode of transmission	?	Ticks (*O. moubata*)	?	Lice ?

REFERENCES.—[1]*Ind. Med. Gaz.* Oct. 1908; [2]*N.Y. Med. Jour.* Aug. 22, 1908.

SPLEEN, SURGERY OF. *John B. Deaver, M.D., LL.D.* } *Philadelphia.*
Astley P. C. Ashhurst, M.D. }

Subcutaneous Rupture of the Spleen.—G. G. Ross[1] reports two cases, both patients recovering, one after operation (packing the rents) and the other under medical treatment. He collects 13 cases reported since Berger's paper was published (300 cases) in 1902.

Splenectomy.—George Ben Johnston[2] has collected 708 cases of splenectomy, for various lesions, including 6 cases of his own; this tabulation includes 360 cases collected in 1900 by Bessel-Hagen. The total mortality in Bessel-Hagen's cases was 36·3 per cent; in Johnston's additional cases it was only 18·5 per cent; the mortality for the combined series being 27·4 per cent. Operations have been done for *wounds and injuries* in 150 cases, with a mortality of 33·33 per cent. That these injuries must be followed by excision of the spleen does not follow as a matter of course. Though loss of the spleen is probably less harmful to the patient than the loss of one kidney, we do not think splenectomy should be adopted except in cases where suture or packing fails to control the hæmorrhage.

Malarial Hypertrophy was the indication for splenectomy in no less than 201 cases (with 41 deaths); that it should be adopted so often for what is usually a condition amenable to medical treatment is cause for surprise. Johnston points out that the increased size and mobility of the spleen subject it to greater danger of rupture or of torsion of the pedicle than the normal spleen, and that these complications may be caused by minor grades of traumatism that would not seriously affect a healthy spleen. But when it is seen that out of this large number of splenectomies (201) for malarial spleen, only 40 were undertaken because the spleen was ectopic, and only 12 for malarial spleen with twisted pedicle, it remains a matter for wonder that medical treatment proved ineffectual in 149 cases, or that surgeons

have resorted to a serious operation without sufficient justification. Johnston's paper, which is purely statistical, gives no clue as to the explanation for this state of affairs. Other affections (hydatid cysts, splenic anæmia, sarcoma, abscess) are generally recognized as sufficient cause for operative intervention ; the same cannot be said of leukæmia, which is represented in these statistics by no less than 49 splenectomies with 43 deaths !

REFERENCES.—[1]*Ann. Surg.* July, 1908 ; [2]*Ibid.*

SPLENIC ANÆMIA, INFANTILE. *George Lovell Gulland, M.D.*

W. K. Hunter[1] reports ten cases. He divides the anæmias of infancy associated with splenic enlargement into three types, the chief point of distinction being the degree of leucocytosis present. In the first, the leucocytes are diminished, as in most of the splenic anæmias of adults, in the second there is a moderate leucocytosis of from 14,000 to 20,000, with little alteration from the normal proportions ; the anæmia is usually more severe than in the first type. In the third type (von Jaksch's anæmia infantum pseudo-leukæmia) the leucocytes number from 20,000 to 100,000 or more, and myelocytes may be present up to 20 per cent. The anæmia in these cases is severe. Hunter concludes that these three types are not distinct, but are merely varieties of one condition, and that the anæmia is not a primary one, but due to a functional disorder of the blood-forming organs. One must presuppose in these cases a debility of the hæmopoietic organs, in part perhaps inherited, but also caused by want of proper food and of fresh air, and by the toxins of measles, syphilis, and other infections. Most of these cases, if they have not gone too far, are curable, and demand especially fresh air, good food, and patience.

REFERENCE.—[1]*Lancet,* Jan. 23, 1909.

SPLENOMEGALY. *Robt. Hutchison, M.D.*

Professor Osler[1] puts forward the following classification of enlargements of the spleen as useful for clinical purposes : (1) In children : disturbances of metabolism and in chronic intestinal affections : Rickets, amyloid disease, and in a large but ill-defined group of intestinal disorders, particularly in the tropics ; the pseudo-leukæmia infantum. (2) In the infections : syphilis, malaria, kala-azar, and other forms of tropical splenomegaly, Hodgkin's disease, and tuberculosis. (3) In primary disorders of the blood-forming organs : leukæmia, pernicious anæmia, chlorosis, hæmachromatosis ; polycythæmic splenomegaly. (4) In cirrhosis of the liver : syphilitic, alcoholic, hypertrophic of Hanot. (5) Hereditary and family forms of splenomegaly : (*a*) with the congenital acholuric icterus ; (*b*) with constitutional disturbances, dwarfing, etc. (6) New growths and parasites : sarcoma, primitive endothelioma of Gaucher (?), echinococcus, and the schistosoma of Japan. (7) Splenomegaly not correlated with any of the above or with any known cause : Banti's disease, with its three stages of (*a*) simple

enlargement, (*b*) splenomegaly with anæmia, (*c*) splenomegaly with anæmia, jaundice, and ascites.

Brill, Mandelbaum, and Libman,[2] in reporting upon a case of primary splenomegaly of the Gaucher type, arrive at the following conclusions as the result of their study of several examples of that variety :—" Splenomegaly (Gaucher type) is a distinct disease, starting in early life, often affecting several members of a family, and running a chronic course. It may be recognized by a great enlargement of the spleen, which precedes a similar enlargement of the liver, and is unaccompanied by jaundice or ascites ; by the discoloration of the skin, especially where exposed to light ; and by the absence in the blood of any characteristic findings. The disease has none of the characteristics of malignancy, and usually terminates as the result of an intercurrent affection. The organs affected are the spleen, liver, lymph nodes, and bone marrow. Histologically these organs show the presence of large cells with small nuclei and a peculiar hyaline cytoplasm, which arise from the endothelium or normal reticulum, and the presence of pigment containing iron. The etiology is unknown, though a peculiar susceptibility of the endothelium or reticulum of the hemapoietic apparatus to some unknown toxic agent is most likely present. There is nothing in our cases even suggesting tuberculosis ; we would say that, when found in cases of this disease, it must be considered as a superimposed process."

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 17 1908 ; [2]*Amer. Jour. Med. Sci* June, 1909.

SPRUE.

(*Vol.* 1909, *p.* 533)—Begg advises **Yellow Santonin.** Cantlie gives **Ipecacuanha sine Emetine** for four days at least, 20 gr. on the first and second days, 15 gr. on the third and fourth days.

STERILITY (Method of Producing in Criminals).

Priestley Leech, M.D., F.R.C.S.

It has remained for the State of Indiana to pass a Bill two years ago for the legislation of the sterilization of confirmed criminals, idiots, rapists and imbeciles. W. T. Belfield,[1] in discussing this question, states that of the three methods proposed, viz., castration, colonization, and vasectomy, the last is much the best ; there is no impairment of sexual power or pleasure ; the operation is not dangerous, and can be performed under cocaine anæsthesia through a skin-cut half an inch long. Some 800 convicts in the prison at Jeffersonville have been sterilized by this method.

REFERENCE.—[1]*Chicago Med. Rec.* Mar. 15, 1909.

STERILIZATION. *Priestley Leech, M.D., F.R.C.S.*

The Skin.—Porter[1] has tried sterilizing the skin by the method of Grossich,[2] of Fiume. The evening previous to the operation, the patient has a hot bath, using plenty of soap, but excessive scrubbing of the operation area is not permitted. It is then shaved, washed, and a piece of dry lint is bandaged on. Nothing more is done until

the patient is on the table. If eucaine is being used, a 10 per cent **Spirituous Solution of Iodine** (practically the liniment. iodi) is painted on the area, and then the eucaine is injected. Before making the skin incision, the area is painted once more. When a general anæsthetic is given, the iodine is painted before the administration is begun, and again when the patient is ready. At the end of the operation the stitches are painted. He has done thirty operations (including appendectomy, radical cure of hernia, varicocele, etc.) by this method, and healing by first intention has occurred in every case. Grossich points out that the preliminary scrubbing and wetting are not desirable, as the superficial layer of the epidermis is not an absolutely compact tissue; the cells are loosely packed, and intercellular spaces exist which communicate with the external air by microscopic clefts. These clefts, which contain fat, sweat, and bacteria, are readily penetrated by an alcoholic solution of iodine, which dissolves their contents. With the ordinary methods of preparation these clefts are likely to be closed by the swelling of the cells caused by hot water, or their contents may be retained by fragments of soap and water.

Lionel Stretton[3] has used the same method in some fifty cases. As he thought the 10 per cent. solution might be too strong, he used the ordinary tinct. iodi of the pharmacopœia, which is one-quarter the strength. He, however, has been bold enough neither to bathe, scrub, or shave the operation area. The solution he uses is 1 part of liq. iodi fort. B.P. and 3 parts of spirit. The spirit is made by mixing equal parts of sp. vin. meth. and distilled water. He has had no means of verifying his results by bacteriological investigations, but they have been uniformly successful. He gives a list of over fifty cases, and if six septic cases are omitted he has fifty-one consecutive successes and no failure. The solution is painted on very freely and widely over the area previous to the anæsthetic, and again immediately before operation. After the stitches are inserted they are painted over for a margin of an inch all round. The first and only dressing is usually made on the eighth day; the stitches are then removed, and the line of incision with a margin of 1 inch is painted with the iodine solution. Included in the cases are hernias, laparotomy, exploration of knee joint, etc.

Instruments.—Tripier,[4] of Lyons, some time ago recommended a bath of oil heated to 130° for the sterilization of complicated instruments and trocars; they were to be placed in a solution of carbolic at 80° to avoid destroying their temper. Conradi[4] recommends the use of **Oil of Sesame** for this purpose. The instruments are placed in the oil in a vessel, and this is heated; the temperature soon attains 200° or more, which is sufficient to destroy all germs, and the method is not very expensive. It may also be used for the sterilization of catheters, etc.

REFERENCES.—[1]*Brit. Med. Jour.* Feb. 6, 1909; [2]*Ibid.* (Epit.) Nov. 21, 1908; [3]*Ibid.* Aug. 14, 1909; [4]*Sem. Méd.* June 23, 1909.

STOMACH, DISEASES OF. *Robt. Hutchison, M.D.*

Achylia Gastrica.[1]—This is a condition in which no gastric juice is secreted. Some cases are functional, i.e., due to a disturbance of innervation. In these the secretion can become re-established. Others are organic, due to atrophy of the gastric mucous membrane. In these the absence of juice is permanent. Achylia is also met with as a secondary condition in cases of carcinoma and pernicious anæmia. The symptoms are not characteristic, and indeed there may be none at all. Many achylia patients, however, suffer from chronic diarrhœa; others exhibit vomiting, flatulence, or gastric pain. The physical signs are also inconclusive, so that the diagnosis can only be made by a test meal. This shows a very low degree of total acidity (only two to six degrees), with complete absence of free HCl. The food is entirely undigested, and the stomach contents are so thick that it is very difficult to withdraw a sample without adding water. No specific cause for primary achylia is known apart from the ordinary causes of nervous dyspepsia and gastritis.

Treatment.—A suitable diet is of the first importance. The food should be presented in such a form that it can easily pass out of the stomach. Animal foods should be tender, and either well chewed or minced; vegetables should be passed through the sieve. **Hydrochloric Acid** (1 dr. of the dilute acid) after meals is useful. Pepsin may be given in addition, but pancreatic preparations sometimes act better. **Nux Vomica** and **Condurango** are good tonics. **Lavage** is helpful where there is fermentation. Woenhert recommends **Intra-Gastric Faradism.**

Early Diagnosis of Cancer,—A discussion on this subject took place last year at the Harveian Society, but little which was either new or helpful was elicited. The most practical counsel is that given by Hale White:[2]—"If symptoms of serious chronic gastric indigestion first appear after the age of forty, organic disease of the stomach should be strongly suspected, and if a comparatively short period of medical treatment does not effect a cure, it may be quite justifiable to open the abdomen." If one waits till a growth is palpable one waits too long. "The commonest symptom of cancer of the stomach is pain, therefore we should be chary of diagnosing this disease if it is absent; on the other hand, constant pain is a considerable point in favour of such a diagnosis. Although the general health of the patient may be misleading, for sometimes it remains good, even when the growth has attained considerable size, yet usually those with cancer of the stomach feel more weak, are much wasted, and more anæmic than those whose dyspepsia is not associated with a growth. The red cells may fall to 3,000,000, the colour index to 0·6, and there may be a small increase in number of polymorphonuclear cells. Loss of appetite, nausea, and repugnance to food, are usually well marked quite early in cancer of the stomach. On the other hand, these symptoms are often absent when the indigestion is not due to growth. And we must always remember that the probability of cancer is greatly

increased if any or all of these dyspeptic symptoms resist ordinary dietetic and other medical treatment." Diminution of free HCl, in order to be of help, must be considerable in degree.

Hertz[3] is of opinion that the constant presence of "occult" blood in the stools is strongly in favour of carcinoma. It is doubtful, however, how early such bleeding begins. He has found little help in diagnosis from the use of the X rays.

Congenital Stenosis of the Pylorus.—Two papers have appeared on the importance of congenital stenosis of the pylorus as a cause of symptoms in adult life. Russell,[4] after reviewing the history of the subject and describing several cases, states that the diagnosis depends upon a prolonged history of gastric trouble combined with the signs and symptoms of a benign stenosis of the pylorus for which no other cause can be assigned. Maylard,[5] who had already described this condition, reports some further cases on which he has operated, and concludes: (1) That there exists an abnormal condition of the pyloric aperture, of probably congenital origin, which consists in an undue narrowing of the orifice, varying anything between 2 and 10 or 12 mm. (2) That the condition is more frequently met with in women than in men, and that the age at which the symptoms first appear depends upon the narrowness of the aperture, and the general physical or constitutional condition of the patient. (3) That the narrowing leads to a more or less chronic condition of indigestion, which is manifested in various forms, and often mistaken for chronic ulceration or chronic gastric catarrh; that in the early stages relief is afforded by careful and strict attention to diet, but that any attempt to return to normal feeding causes a recrudescence of indigestion. The attacks of gastric discomfort are at first separated by considerable intervals, but these lessen in length as time goes on. (4) That when the patient is advanced in life and shows marked general debility, operation will prove of doubtful value. (5) That, barring such considerations as those mentioned in paragraph 3, pyloroplasty or Finney's operation—preferably the former—should be practised.

Gastric Ulcer.—Spriggs[6] reports favourably upon his experience of the **Lenhartz Method** of treatment (see *Annual*, 1909). The routine adopted is as follows:—The patient is kept absolutely in bed for four weeks, for the first two of which he is not allowed to move from the supine position for any reason whatever. All mental excitement must be avoided. An ice-bag is kept upon the stomach almost continually for the first two weeks. The dietary consists of eggs beaten up with sugar, or in some cases with wine, and iced; and of milk. These two foods are taken in small quantities at frequent intervals from a teaspoon, the quantity prescribed being spread over the day, and not given at definite meal times. The first day 7 to 10 oz. of milk are given and one egg. The quantity is increased daily by 3½ oz. of milk and one egg, until 1¾ pints of milk and six eggs, or in some cases eight eggs, are reached. From about the third to the eighth day, raw or almost raw mince is added, starting with an ounce

in divided doses, either beaten up with the egg or alone ; the next day, if the mince is well borne, 2 oz. are given ; in these cases minced beef was used. From the seventh to the eighth day boiled rice is added, followed by softened bread, and later by a small quantity of bread and butter. One or more eggs may now be lightly boiled. The diet is then gradually increased by the addition of mince or pounded fish, with a corresponding reduction of eggs, until by the end of the fourth week the patient is on an ordinary mixed diet containing the common foodstuffs, with the exception of indigestible solids such as peas or other seeds. The patient is instructed to masticate very slowly. On the twenty-eighth day he is allowed to get up, and is discharged from the sixth to the tenth week. For the first ten days bismuth subnitrate is given in doses of 30 gr. in water without mucilage twice or three times a day. From the sixth to the tenth day sulphate of iron is prescribed in the following form :—

R	Sulphate of Iron	gr. cl	Glycerin.	3j
	Calcined Magnesia	gr. xx		

Mix and divide into 60 pills.

Two of these are given two or three times a day. Lenhartz increases the dose gradually, giving 3 for three days, 4 for four days, up to 10 for ten days, and then down again. In some cases arsenic is added. The bowels are not disturbed at all during the first week, unless they are naturally opened. An enema is then given and repeated every fourth day during treatment. The mouth should be washed out and attended to regularly.

It is claimed for the Lenhartz method that it is suitable for all forms of gastric ulcer except, of course, those associated with mechanical deformities, such as stenosis of the pylorus, and those in which some serious complication, such as perforation, peritonitis, or subphrenic abscess, is present. It is said that the sour regurgitation, the vomiting, and the pains and distress after food, disappear in from a few hours to a few days. The method is reported as having been found successful after recurrent hæmorrhages have occurred on rectal feeding. It is important that patients should be kept in hospital some weeks after they have reached full diet, for a case cannot be recorded as cured until not only are there no symptoms, but the percentage of hæmoglobin and the weight are normal.

Borgbjærg[7] reviews the literature on the dietetic and medicinal treatment of gastric ulcer in the last few years, and relates his own experience. He agrees with Lenhartz and Thesen that the stomach mucosa is not sensitive, and that consequently the pains experienced are the result of the spread of the inflammation into the lymphatics, or of traction on the parietal peritoneum from the contractions of the stomach. In treating an ulcer, therefore, it is important to avoid all articles of diet liable to promote peristalsis. For this reason also the food should be given in very small quantities ; if there is much thirst, water can be supplied by the rectum. Thesen allows nothing but lukewarm milk at first, a tablespoonful at a time, to a total of 250 cc.

(8 oz.) during the day, increasing an ounce each day during the first week; with one raw egg the second day, two the third, three the fourth, and so on, with nothing but the milk and raw eggs until the seventh day. At the same time he gives 10 grams (150 gr.) bismuth daily, believing that it diffuses into the lymphatics and arrests the lymphangitis. His experiences with thirty-five patients thus treated during the last two years have been favourable. Benefit is also liable to be obtained from **Olive Oil,** and Borgbjærg has had some striking results on this line, especially when bismuth is given with it, using a 7 to 10 per cent suspension. In one of his cases hematemesis was the first symptom, followed by sudden pain in the stomach region, hypersecretion, and morning retention. During the following six months the man lost constantly in weight, with no improvement under dieting and a course of Carlsbad water. He took 100 grams (3 oz.) olive oil every morning, and the pains promptly subsided, while he gained nearly 25 lbs. in weight, and the suspicion of cancer was dispelled. The combination of olive oil and bismuth generally proves more effectual than either alone.

V. Talna recommends the use of **Atropine** in gastric ulcer. It acts by relieving pain, arresting pyloric spasm, and lessening the secretion of acid. He gives 2 to 3 mgrams daily.

Hort[8] treats cases of chronic gastric and duodenal ulcer by the internal administration of an **Anti-ulcer Serum,** with the object of establishing an immunity of the gastric mucosa to the action of gastrolytic toxins. In his hands the method has proved very successful. The following are the details of the treatment: In chronic cases, with or without hæmorrhage, no drugs are allowed throughout, with the exception of some simple purgative. Complete rest in bed for two or three weeks is insisted on; more than this is not necessary or desirable. As regards diet, no milk, soup, or fish in any form are allowed from first to last. For the first three or four days small meals are given every three hours during the day; no meals at night: they consist, in rotation, of small quantities of stale bread, the yolks of lightly-cooked eggs, and panada or quenelle of chicken. The only liquid allowed is 10 oz. of hot water at 7 a.m., 11 a.m., and 10 p.m. If all goes well, at the end of four or five days the dietary is doubled in quantity. On the seventh or eighth day pounded meat, lightly cooked, is added. By the end of the second week meat forms the chief food, and the meats chosen are beef and mutton. In three weeks from the commencement of treatment full diet is generally well borne, but alcohol, soup, tea, coffee, and all starchy puddings are forbidden for six months. As regards the serum, it is given by the mouth three or four times a day directly after food, in ½ oz. of water. If pain is unusually severe, or if hæmorrhage still continues, 60 cc. to 80 cc. may be given in the twenty-four hours. In all severe cases the serum is continued for six weeks or longer. The serum used is either fresh normal horse serum or serum with its antilytic valency artificially increased by the addition to normal of serum stripped of its

globulins. It must be fresh, atoxic, and sterile. The horse from which it is drawn must be free from obvious disease, and the dates at which it is bled must be noted, as serum from a later bleeding is more potent to arrest hæmorrhage than from an earlier. The serum may be standardized as regards its power of limiting self-digestion by Golla's conductivity method. Its albumin content, the gauge of antilytic power, can also be chemically estimated. At present its standardization as regards stimulin content cannot be accurately determined, but a very fair idea of the potency of any given sample in this respect may be gained by observing the amount of reaction when applied to an old-standing superficial wound. If the sample tested does not produce a well-marked reaction in twenty-four to thirty-six hours, it should be rejected.

REFERENCES.—[1]Woenhert, *N.Y. Med. Jour.* Nov. 14, 1908, Hutchison, *Clin. Jour.* Jan. 6, 1909; [2]*Brit. Med. Jour.* April 3, 1909; [3]*Med. Press*, Mar. 24, 1909; [4]*Brit. Med. Jour.* July 11, 1908; [5]*Ibid.*; [6]*Ibid.* April 3, 1909; [7]Abst. in *Jour. Amer. Med. Assoc.* Nov. 21, 1908; [8]*Brit. Med. Jour.* Oct. 10, 1908.

STOMACH, SURGERY OF.

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Gastric Ulcer.—While it is undeniable that both the medical and surgical treatment have made considerable advances during the last five years, it is nevertheless apparent to the unprejudiced observer that our knowledge of the disease has not yet reached such a satisfactory state as enthusiasts would have us believe. Gastric ulcer is a grave disease, and requires *strict, systematic*, and *prolonged* treatment. Medical men who hope to send their patients out of the wards well within a few weeks are becoming more and more scarce; and even the surgeon, at first blinded by the brilliance of his primary successes, is beginning to realize that the mere performance of a gastro-enterostomy or other operation is not the only thing needed; but that in very many cases, if not in all, his patients are only put in such a condition by the operation that medical measures, diet, etc., will be able to complete the cure. Both physicians and surgeons realize that in a large proportion of cases cure without operation is impossible, but the question which still vexes them is: *When* shall operation be done? They are agreed that medical treatment should be tried first, and that operation must not be too long delayed; but the crux of the matter is to decide on the propitious time which is neither too early nor too late.

This question concerns both physician and surgeon; the next query must be decided by the surgeon unaided—it is, what shall be the operation? Gastro-enterostomy, pyloroplasty, pylorectomy, or excision? We venture to think that heretofore there has been too little discrimination exercised in relating the special operation to the individual case. Some surgeons have been widely celebrated as partisans (we choose the word carefully) of gastro-enterostomy; others

favoured resection or pylorectomy ; and others again treated all their patients by some form of pyloroplasty.

Now, it seems to us that the matter is becoming much more complicated than this ; and that instead of surgeons piling up long lists of operations with a vanishing mortality, it will become necessary for them to distinguish different classes of gastric lesions—ulcers or their results—and adapt their operation to the lesion found, instead of treating practically all types of lesions by one type of operation. This fact is well recognized by Marnoch[1] in an interesting communication based on his experiences in 60 cases. If this theory be correct, as we believe it to be, it will necessitate much more careful diagnosis both before operation and after the abdomen has been opened. It will no longer do to divide gastric lesions into benign and malignant alone ; sub-varieties of each class must be more clearly recognized, and a different operation must be employed, and at a different period of the disease in one variety of it from that which will be suitable for a somewhat different lesion.

Thus open ulcers of the stomach may be said to form one class of cases ; but do open ulcers at the pylorus or in the duodenum require the same operation as open ulcers along the lesser curvature or in other parts of the stomach ; and do not pyloric and duodenal ulcers demand earlier surgical interference than ulcers elsewhere situated ? Does not pyloric stenosis from ulcer require a different operation from pyloric ulcer without stenosis ; and does not pyloric stenosis without ulcer indicate some operation different from that employed for stenosis with open ulcer ? These questions will have to be answered within the next few years ; and they can be answered only by surgeons in control of sufficient clinical material to enable them to differentiate their results according to the lesion found. This has been attempted in a valuable paper by Drummond and Morison,[2] who report their experience from 123 gastro-enterostomies during the last three and a half years. Morison acknowledges that he has always had, and has still, a prejudice against any operation which alters so materially the anatomy and physiology of important viscera as gastro-enterostomy does ; but though formerly an advocate of pyloroplasty, he now favours gastro-enterostomy because the good results of the latter are more lasting than those following pyloroplasty. In about 20 per cent of his cases of pyloroplasty there was a recurrence of trouble, sometimes after several years ; and at subsequent operation he found these symptoms were caused, not by contraction of the pylorus, but by fresh ulceration. After gastro-enterostomy, on the other hand, new ulcers do not form. He unreservedly accepts the theory that gastro-enterostomy produces a cure, not by its mere mechanical action, but by changing the chemistry of the stomach, thus overcoming the hyperchlorhydria. This view certainly seems to have most to support it, and offers an explanation of the success which still attends the employment of anterior gastro-enterostomy, without regard to making the anastomosis " at the most dependent point " of the stomach.

Drummond and Morison have succeeded in tracing 100 out of the 118 patients who recovered after operation. The following table shows the results:—

	Operation.	Died.	Recovered.	Traced. Cured.	Impvd.	Not impvd.	Not traced.
Gastric Ulcer ..	14	1	13	8	2	—	3
Pyloric Ulcer ..	16	0	16	10	2	—	4
Pyloric Stenosis ..	36	2	34	29	0	2	3
Hour-glass Stomach	6	0	6	5	1	—	0
Duodenal Ulcer ..	28	2	26	20	3	1	2
Miscellaneous:							
Gastric & Duodenal Ulcer	3	0	3	3	0	—	0
Undiagnosed ..	3	0	3	0	3	—	0
Uncertain Termination:							
Cancer (?) Inflammatory (?)	7	0	7	3	0	—	4
Jejunal Stricture ..	2	0	2	0	0	—	2
Various	8	0	8	2	0	6	0
	123	5	118.	80	11	9	18

Gastric Ulcer and its Treatment.

Leech[3], from the standpoint of a physician, studied the results of 128 gastric operations at the Manchester Royal Infirmary (79 for non-malignant, 46 for malignant disease). He had been impressed by the fact that patients with gastric ulcer are treated in medical wards for a few weeks and are then discharged, to develop almost certainly either recurrence of pain, vomiting, etc., or worse, hæmorrhage or perforation. Of the benign cases he found that in 68 per cent the operation (gastro-enterostomy) had been "worth while," while in 32 per cent it had secured no improvement, or had been followed by death within two months. The failures were thus unexpectedly large, and were to be attributed, he thought, either to imperfect selection of cases, or to errors in operative technique. Among the former may be included two patients who later developed locomotor ataxia, early gastric crises from which probably suggested operation; though in one of these it is likely that a gastric ulcer was actually present. Among the errors in technique were gastro-enterostomy in the pyloric instead of the cardiac pouch of an hour-glass stomach; union of ileum instead of jejunum to stomach; general peritonitis, etc.

Of the 46 malignant cases, all treated by gastro-enterostomy, only 15 (32 per cent) were benefited, relief from vomiting and sometimes temporary relief from pain being the chief benefits; 6 of these patients were able to resume work for a year; one survived thirty months. In 10 patients (22 per cent) no relief was obtained, but life was prolonged on an average six months after operation, thus making the result of operation actually distressing, bringing no relief, and prolonging a miserable life. Twenty-one patients (46 per cent) died within two months of operation (gastro-enterostomy). He thinks these results could all be improved by earlier operation for non-malignant as well as for malignant cases.

Sherren[4] since 1904 has operated by gastro-enterostomy on 60 patients for duodenal or gastric ulcer. One patient died, after five days, from pneumonia; of the others, all of whom have been traced, "all have lost their symptoms," and in only one is there even discomfort.

Alexis Thomson[5] reports the results in 50 cases of operation for gastric or duodenal ulcer. He employed resection 3 times, with 1 death; he condemns it, as in his cases the suspected malignancy was proved non-existent, and in only one of his 47 cases treated by gastro-enterostomy did malignancy develop later (16 months after operation): he thinks resection an unnecessarily severe remedy. There were 3 deaths among his 47 gastro-enterostomies; 1 patient was not traced, 4 died later of intercurrent maladies, and 1, as noted above, of gastric carcinoma. Of the remaining 38 cases the cure was permanent in all, 33 being absolutely, and 5 very nearly, relieved of all gastric symptoms.

Clairmont[6] reports the results of operative treatment of gastric ulcer in 259 patients at von Eiselsberg's clinique. A complete cure resulted in 52 per cent, and improvement in 15 per cent of the cases. The most gratifying results followed operations for ulcers close to the pylorus.

Borszeky[7] studied the results of gastric operations at the Budapest clinique. Of 22 patients who recovered after gastro-enterostomy for benign disease, 19 were permanently cured; 1 was permanently improved; and in 2 only temporary improvement occurred. In 69 per cent of the cases of pyloric stenosis, and in 89 per cent of the chronic (callous) ulcers, a permanent cure was noted. After medical treatment, 77 per cent were permanently cured; while after surgical treatment 80 per cent of the total number were permanently cured. From these figures Borszeky concludes that medical treatment should always be tried first, and when it fails, or in cases which relapse, operation will be able to bring about a cure in most cases.

Bidwell,[8] having traced 81 patients after operation for benign disease, found 56 per cent absolutely cured, and 26 per cent more almost entirely relieved. He concludes: 85 per cent successes, 10 per cent failures, 5 per cent deaths.

Surgical Treatment of Hæmorrhage from Gastric Ulcer.—Kraft[9] urges the advantages of **Rovsing's Gastroscope** in locating the bleeding point. The instrument is introduced into the stomach through a small incision in its anterior wall, and the bleeding point detected by the lessened translucency at the affected point (diaphanoscopy). He has succeeded twice in finding the bleeding point with ease by this method, and in controlling the hæmorrhage by ligature. The first patient was cured, but in the second case an accident caused short-circuiting of the electric current, resulting in sloughing of the tissues, from which the patient died.

Perforated Gastric or Duodenal Ulcer.—Two questions in the treatment of these conditions are still debated with considerable warmth. The first is whether or not gastro-enterostomy should be done as a

primary operation, at the time the perforation is sutured ; or whether it should not be done then, but later, if the symptoms persist or recur. Most experienced surgeons adopt gastro-enterostomy as a primary operation, unless the patient is very severely shocked or the peritonitis very widespread. And it may be well to note that extravasation of gastric contents does not necessarily imply the existence of widespread peritonitis. Time is required for peritoneal infection, reaction, and exudation, and if the patient is operated on sufficiently early, there is no reason to assign diffuse peritonitis (which may not exist) as a contraindication to the slight prolongation of the operation required to perform gastro-enterostomy ; but the occasional operator, or he who is not in the habit of performing gastro-enterostomies, may very properly feel a Hallerian diffidence about prolonging his manœuvres in any way.

The good that primary gastro-enterostomy may do is indicated by the following : It will aid the sutured ulcer to heal, in the same way it might have prevented its perforation if done before that event. It will aid the healing of other ulcers, which are usually present, and will prevent their perforation during convalescence. It will almost certainly relieve the patient of any gastric symptoms, which are by no means inapt to persist after the suture of a perforation. And, especially if suture of the perforation has caused stenosis of the pylorus, the employment of gastro-enterostomy at the time of the suture may be the means of preventing death from obstruction. The harm that may come from its injudicious employment and its performance by incompetent operators will sometimes result in the patient's death. We have no doubt that in the hands of some surgeons the patient will run less risk from the danger of pyloric obstruction or of subsequent perforation than he would from the technically imperfect performance of a primary gastro-enterostomy.

The other question in connection with the treatment of gastro-duodenal perforations is whether or not the general peritoneal cavity shall be irrigated ; whether it shall be cleansed by dry sponging ; or whether the surgeon shall content himself with the insertion of proper drainage. The question of irrigation has been warmly discussed *pro* and *con.*, and many surgeons who have abandoned irrigation in cases of diffuse peritonitis from appendicitis or other causes, claim that where actual gastric contents are extravasated it is imperative to remove them by irrigation. Practically all surgeons are content with very gentle local sponging where extravasation is slight and well limited.

During the past year Morton[10] has reported 10 operations for gastric perforation, with only 3 deaths, and Marnoch[11] has recorded 18, with 9 deaths—but only 2 among his last 9 operations. Both surgeons employed thorough irrigation in cases where the gastric contents were widely diffused.

At the February, 1909, meeting of the Philadelphia Academy of Surgery,[12] there was an interesting discussion on the subject of perforated gastric and duodenal ulcers. Jopson recorded 2 operations

and M. B. Miller 1, recovery following in all 3 cases. Deaver, who has operated on 5 cases, all of which terminated in recovery, employed gastro-enterostomy in every instance, and never used irrigation. Gibbon reported 8 operations with 5 deaths; he opposed gastro-enterostomy as a primary operation unless the pylorus was stenosed as the result of the suture; in one case he had to resort to gastro-enterostomy eighteen months later, for persistence of symptoms. Le Conte echoed the remarks of Gibbon, opposing gastro-enterostomy save in exceptional cases; but recommending irrigation in those with much extravasation of foodstuffs. Ashhurst reported a successful suture of a duodenal perforation without gastro-enterostomy, and called attention to the fact that cultures made from the gastric contents found in this patient's pelvis remained sterile, while those made from the discharges from the epigastric wound a week after operation gave a growth of the colon bacillus. He thought that the question of the bacteriology of the extravasated matters should have much influence in determining for or against irrigation of the abdominal cavity; in his own case, as this question was undetermined at the time of operation, free irrigation was employed.

Now this seems important: if the gastric contents are usually sterile, this fact explains the successes of those surgeons who do not employ irrigation; and if surgeons who see many cases of gastric perforation will have bacteriological investigations made of the peritoneal contents, the question can be answered in a scientific way in the near future. The bacteriology of peritonitis is very little understood, and much work remains to be done to enable us to approach on sure ground, and to treat with intelligence, cases which now are managed on purely empirical lines.

The use of *omental grafts* to cover in perforations which cannot be sutured, is commended by Corner and Bristow,[13] who employed it successfully in two cases. Solieri[14] commends their employment in perforations elsewhere in the intestinal tract. The term employed by him (*enterocleisis*), though etymologically correct, is unfortunate, as being liable to confusion with enteroclysis.

Excision of Perforated Ulcer.—Dowden,[15] in five cases of perforation near the pylorus, has adopted excision of the ulcer in the long axis of the viscus and suture in the transverse axis, thus performing a modified pyloroplasty; all his patients recovered. He recommends this method because "firstly, the ulcer is got rid of—to a great extent at least; and secondly, the healthier tissue exposed is much more suitable for rapid and safe suturing." Having tried orthodox methods in 10 other cases, he has come to the conclusion that the method employed in the last 5 is much better.

In the case of an ulcer which had *perforated into the pancreas*, Klapp[16] determined to attempt excision, as gastrojejunostomy gives such uncertain results for ulcers not near the pylorus. To accomplish his purpose he had to do a splenectomy, being then enabled to approach the posterior wall of the stomach from the region of the fundus, and

successfully to separate the posterior gastric wall from the pancreas. The patient recovered.

Duodenal Ulcer.—This is generally recognized as a more serious disease than gastric ulcer, the ulcer being much less apt to heal under medical treatment. The nearer the ulcer approaches the pylorus the more it resembles pyloric and therefore gastric ulcer. The symptoms given as typical of duodenal ulcer refer more especially to those which are not juxta-pyloric in position ; and the distinction made by the Mayos between gastric and duodenal ulcers, according to their relation to the pyloric vein, has, as we have elsewhere pointed out, a more theoretical than practical importance. As W. J. Mayo[17] has said, " We have in the majority of instances been talking about gastric ulcer, writing about gastric ulcer, and treating patients for gastric ulcer, when the trouble was primarily in the duodenum and not in the stomach." Now it is evident that merely giving these ulcers (formerly classed as gastric) a new name, because of their relation to the pyloric vein, will change neither their clinical pathology, symptomatology, nor the indications for treatment. According to this new classification, the Mayo brothers found, during 1906–07, that their patients presented duodenal ulcers in 61·7 per cent of cases ; gastric ulcers in 31 per cent ; and a separate ulcer in stomach and duodenum in 7·3 per cent.

Sherren[18] gives his experience with duodenal ulcer. At the London Hospital there have been treated during the last 10 years 174 cases of perforated peptic ulcer (132 gastric and 42 duodenal)—evidently not classified according to the relation of the ulcers to the pyloric vein of Mayo. Sherren divides duodenal ulcers into four groups according to the symptoms : (1) Those in which the symptoms which bring the patient under medical care are due to perforation ; in many, this is the very first symptom noticed ; (2) Those in which a definite diagnosis may be made ; (3) Those in which the diagnosis of a peptic ulcer of stomach or duodenum may be made, but the symptoms are not clear as to which it is ; (4) Those in which the diagnosis is not possible until operation. He subdivides the cases of perforation into two groups : (*a*) Those in which the diagnosis of a perforated peptic ulcer is possible ; (*b*) Those in which the first symptoms which bring the patient under observation resemble those of an appendicitis, or are produced by subphrenic abscess ; and he notes that in many of this second group the onset is gradual. He acknowledges that he is satisfied to diagnose a perforation in the upper abdomen, without making undue endeavours to distinguish between the stomach and duodenum as the seat of the lesion, but he thinks error in diagnosis is more frequent in the presence of duodenal than in that of gastric perforation. In 7 out of 11 cases of perforation under his care it was possible to determine that the upper abdominal region and not the appendix was affected ; but we do not think much reliance is to be placed on his contentions that appendicitis frequently begins during the night, and that gastric and duodenal ulcers rarely perforate except during the day-time.

An important point to which he calls attention is that fat necrosis may occur in cases of duodenal perforation from extravasation of pancreatic juice ; and that therefore the surgeon on seeing fat necrosis should not hastily conclude that the pancreas alone is at fault.

Prognosis of Duodenal Perforation.—Sherren[18] reports 11 operations for perforated duodenal ulcer, with 8 deaths ; and 15 cases of perforated gastric ulcer, with 7 deaths. At the London Hospital during the last 10 years, 32 cases of perforated gastric ulcer have been operated on, with 67·4 per cent mortality ; while 42 operations for duodenal perforation gave a death-rate of 80 per cent. From this he concludes that gastric is less severe than duodenal perforation, chiefly because the precocity of the symptoms renders immediate operation imperative, while in many cases of duodenal ulcer the symptoms at onset are subacute, and operation is postponed because the condition is not recognized. Moreover, he notes that the cases of duodenal perforation which are readily diagnosed are those nearest the pylorus, thus resembling gastric ulcer in the sudden onset of their symptoms, which we think lends support to our statement that Mayo's method of differentiating duodenal from gastric ulcers is of little practical importance.

Jejunocolic Fistula.—Lion and Moreau[19] have contributed a valuable monograph on this subject, based on a study of 5 cases, of which 2 are original in the experience of these authors. Perforation of the jejunum into the colon is a rare termination of jejunal ulcer, as may be seen from the following table of the terminations in 42 cases of peptic jejunal ulcer collected and studied by Lion and Moreau : Plastic peritonitis, 28 cases ; acute perforative peritonitis, 8 ; jejunocolic fistula, 5 ; stenosing ulcer of jejunum, 1 ; total 42. All 5 cases of jejunocolic fistula were in men, thus corresponding to jejunal ulcer in general, which was observed 38 times in men, only 4 times in women ; they all followed *posterior* gastrojejunostomy, 4 times by lateral anastomosis, once by the method of Roux.

Among the *causes* they note that in all cases the gastro-enterostomy had been done for open ulcer with hyperchlorhydria ; and think the direct influence of this hyperchlorhydria caused the jejunal ulcer ; yet the patient did not come under treatment for this complication until five to seven years after gastro-enterostomy. This ulcer is habitually on the anti-mesenteric circumference of the bowel, and naturally in posterior gastro-enterostomy becomes adherent to the colon, while in anterior gastro-enterostomy adhesions to the anterior abdominal wall develop. Thus in Paterson's first case the jejuno-cutaneous fistula followed an anterior gastro-enterostomy. It is, we think, of interest to inquire whether it is not possible that some of these jejunal ulcers may not exist in an undeveloped state even before the primary operation is done, and that their subsequent perforation therefore occurs in spite of, and not necessarily because of, the gastro-enterostomy. There have been occasional reports of jejunal cicatrices found at autopsy, evidently due to healed jejunal

ulcers ; and Blanc and Mossé[20] have recently operated on such a case which had been diagnosed as pyloric obstruction.

The *diagnosis* is made with difficulty from gastrocolic fistula, though Lion and Moreau think that truly fæcal vomitus speaks in favour of a direct communication between stomach and colon, and against an indirect communication through the jejunum.

Treatment is purely surgical, and consists in separation and repair of the perforation, if this is possible, and in entero-anastomosis (preferably ileosigmoidostomy) in case the colon is strictured by repair of the fistula. If the jejunocolic fistula cannot be successfully separated, some form of intestinal exclusion should be attempted. All 5 patients were operated on, 3 recovering, 1 dying from peritonitis, and 1 from a subsequent perforation of the jejunum into the peritoneal cavity, the jejunocolic fistula not having been discovered at the operation, which consisted solely of separation of adhesions in front of the colon.

Jejunal and Gastrojejunal Ulcer following Gastro-enterostomy.— Paterson[21] has collected 60 cases of this kind. He reckons that the probable risk of a jejunal ulcer following gastro-enterostomy is less than 2 per cent. He objects to the term peptic ulcer of the jejunum, as implying a cause which probably is not operative ; and classes as gastrojejunal ulcers those which occur at the gastro-intestinal anastomosis.

Two main groups of cases are recognized, the *acute* and the *subacute* perforations. The mortality following operation in the former group is less than that in the latter; this curious fact probably may be explained by recollecting that in subacute cases the diagnosis usually is more difficult, and the operative procedure much more tedious and prolonged, necessitating extensive separation of adhesions. 78 per cent of the patients were males.

The *cause* he attributes to hyperacidity of the gastric juice, especially excess of free hydrochloric acid ; this acts as a direct poison to the jejunal mucosa, and when this has been killed, the intestinal juices digest it, forming an ulcer. In one-third of the whole series of cases the ulceration was at the gastrojejunal anastomosis ; this is to be attributed to the direct injury done the parts at operation, aided by the hyperacidity. As a preventive, he counsels abstention from meat for six months following operation, and in cases of marked hyperacidity special diet (milk and eggs) as well as antacids in addition. The same methods may be attempted for the *cure* of these lesions if chronic, before operative treatment is undertaken. This consists in suture of the acute perforations, and in excision or ablation of the subacute perforations ; while in the case of unperforated jejunal ulcers, the original gastrojejunostomy opening must be enlarged. Mr. Paterson suggests for cases in which, after surgical treatment, the symptoms recur, that the jejunum may be cut across and a Y anastomosis performed, implanting the *proximal* limb into the stomach ; in this way the entire duodenal contents will pass through the stomach

and thus effectually reduce the gastric hyperacidity. Paterson[22] reports two cases—one in which a jejuno-cutaneous fistula formed, the other in which a cicatrix was found in the jejunum at autopsy. He presents analyses of the gastric juice and of the discharge from the fistula in the first patient, tending to show the etiological influence of hyperchlorhydria in the production of this sequel of gastro-enterostomy.

Hourglass Stomach.

Veyrassat[23] has published an elaborate paper on this subject, summarizing our knowledge to date. He treats at length the questions of history, etiology, pathology, anatomy, symptoms, diagnosis, and treatment. While he admits that there may be such a thing as a congenital hourglass stomach, he states that we have a right as practical surgeons to ignore its existence. He urges radiography as the only certain means of making a diagnosis; other methods, with attention to Wölfler's and Jaworski's signs, he thinks only suggestive, as they are so frequently erroneous.

The results of the most frequently employed operations may be seen in the following table compiled from his statistics :—

Operation.	Cases.	R.	D.	Mortality per cent.	Cured per cent.	Failed per cent.
Gastrogastrostomy ..	22	18	4	18	68	13·6
Gastroplasty	48	43	5	10·4	75	14·6
Gastrojejunostomy ..	73	59	14*	19·1	78	2·73
Cylindrical gastrectomy	12	11	1	8·3	91·6	—
Resection	3	1	2	66·6	—	—
Partial gastrectomy ..	2	2	—	—	100	—

* Six deaths due to anastomosis with pyloric instead of cardiac pouch.

He condemns gastroplasty in most unqualified terms, in spite of the statistics showing a cure in 75 per cent of cases. Cylindrical (annular) gastrectomy (removing the entire diseased portion of the stomach and re-uniting its divided cardiac and pyloric pouches) he regards as the ideal operation, which should be adopted whenever the stomach is, or can be made, sufficiently mobile, and when the constitutional condition of the patient will permit. This failing, he prefers gastro-enterostomy; and he calls attention to the fact that the extraordinary mortality which appears in his statistics may be diminished not only by subtracting the six deaths due to the anastomosis having been mistakenly made in the pyloric pouch, but also by the fact that a number of the operations date from the early days of gastric surgery, when the operation was long and difficult. To illustrate the ease with which gastro-enterostomy is performed nowadays, he mentions that he has seen Jaboulay complete the entire procedure, by the aid of his button, in the short time of nine minutes, this including the suturing of the abdominal wound. An extensive bibliography is appended to this monograph, which would have had more value, we venture to think, if the author had shown some familiarity with the *Inaugural Dissertation* of Schomerus (Göttingen,

1904), whose statistics are very nearly as complete, though published five years earlier; and if his acquaintance with the case reports of American surgeons had been a little more extensive.

Delore and Alamartine[24] also write on this subject, calling special attention to the fact that a large proportion of cases of hourglass stomach are due not to cicatrices or adhesions, but to ulcers in course of evolution. Most of these ulcers are of the chronic, callous variety, show no tendency to heal, and in a number of cases deserve the name *ulcero-cancer*, presenting, according to these authors, the histological changes recognized as *precancerous* by the Lyons surgeons. On these grounds they urge very earnestly that cylindrical gastrectomy or partial gastrectomy (pyloro-gastrectomy) should be employed more frequently in the future. They have treated three patients in this way themselves, one patient dying from pneumonia, but the others obtaining complete relief from their symptoms. Delore and Alamartine condemn atypical resections of the stomach as having too high a mortality; they rightly hold that the more nearly any operation can be reduced to a type, the more successful it is apt to be. With preliminary gastrolysis cylindrical resection often may be done in cases which at first seem inoperable. They quote the experience of Riedel,[25] based on 23 operations of cylindrical gastrectomy for hourglass stomach, with 6 deaths (26 per cent mortality), but none of these deaths were attributed by him directly to the operation, but to pre-existing cardiac or pulmonary affections. Two of Riedel's operations were for undeniable carcinoma; this leaves 21 cylindrical gastrectomies (with 5 deaths) for ulcer properly so-called. Adding these 21 operations to the 14 previously published, Riedel finds 35 cylindrical gastrectomies for benign hourglass stomach, with 5 deaths, a mortality of about 14 per cent; which is about the same as, or a little less than, that of gastro-enterostomy for the same condition.

Acute Dilatation of the Stomach.

This mysterious disease is still a fruitful subject for discussion. Borchardt[26] contributes a critical article, reporting in detail one case observed by him in 1902. He inclines to the theory that the real cause is primary atony and dilatation of the stomach; that this gastric dilatation pushes the small intestines into the pelvis, and that only at this stage does "mesenteric occlusion of the duodenum" occur. J. W. Draper Maury,[27] in experiments to determine the cause of death in intestinal obstruction, appears to have come near solving the physiological problems underlying the symptomatology of acute dilatation of the stomach. At first sight the statement of Rutherford Morison,[28] that he believes that the symptoms formerly attributed to the "vicious circle" are due to essentially the same causes as what is now known as acute gastric dilatation, seems startling; for surgeons have been accustomed to separate mentally these two conditions. Yet Maury's experiments seem to lend support to Morison's contention,

and give a physiological explanation of the clinical fact observed by ourselves, that the longer the afferent loop in cases of the vicious circle, the less rapidly fatal is the course of the disease.

Cancer of Stomach.

There have not been very many contributions during the past year to the subject of gastric cancer. Moynihan,[20] in opening a discussion at a meeting of the Harveian Society of London, dwelt upon the fact that the only visible method by which the prognosis could be improved was in a wider recognition of chronic (callous) ulcer of the stomach as the main predisposing cause of carcinoma of this organ. Approximately two in every three patients operated on by him for gastric cancer " have had a history of previous gastric ulcer. In the majority of those who give this history there has been a constant succession of attacks, similar in all their chief manifestations and brought about by similar causes. In the last attack the symptoms have been more protracted, not amenable to treatment, not relieved by the drugs which proved successful before ; and by degrees it has become unmistakable that this attack is likely to prove of a far more serious character."

The difficulty is to recognize the change from simple to malignant disease early enough for a radical operation to be possible. " While the ulcer is still simple," writes Moynihan, " there is rarely a distaste for food ; on the contrary there is often a feeling of great desire for food ; but experience has shown that indulgence is followed by distress or pain. I have commonly heard it said, ' I could eat anything, but I dare not.' In patients suffering from well-established cancer this is never heard ; the cry is always that the thought of food is abhorrent, and it is difficult to persuade a patient to overcome his intolerance."

He divides patients with gastric cancer symptomatically into three classes : " In the first, the patient stoutly denies, nor can any persuasion induce him to recall, any earlier illness or suffering in connection with the stomach. . . . In this condition of good, even robust, health there has been a forcible and abrupt intrusion of symptoms hitherto unknown." " In the second class are placed all those cases in which a clear history of chronic gastric ulcer can be obtained. In some of these cases there has been only one attack, or possibly two or three attacks rapidly succeeding one another within the period of a single illness, followed by a complete abeyance, or at least a complete latency, of all symptoms until the onset of the malignant disease. In other cases the patients have had a long series of attacks, in many respects closely similar to the present one, of ' indigestion.' " " In the third group the patients, who are generally between 40 and 45 years of age, give a history which in all its essential details is identical with that in group 2. But there is one significant omission. No history of any illness which can be referred to a structural lesion in the stomach can be elicited. The whole clinical course is comprised in the one

sustained illness which, without haste but without pause, has brought the patient into a condition of serious ill-health."

The diagnosis, then, must be based largely on the clinical history; the physical signs are usually indefinite until an inoperable stage has been reached. Of the aid derived from chemical analysis of the gastric contents, Moynihan has this to say: "Briefly stated, my opinion is that the early diagnosis of carcinoma of the stomach receives only the slenderest help, if indeed it receives any, from those examinations."

The operation of **Partial Gastrectomy,** as he now performs it, consists in dividing the duodenum after ligation of the pyloric, gastro-duodenal, and left gastro-epiploic arteries (not the coronary), and division of the gastro-hepatic omentum close to the liver; the gastrocolic omentum is then ligated and divided, the stomach turned to the patient's left, and the coronary artery ligated and divided. A posterior gastrojejunostomy is then done *before the stomach is cut away*. Finally, the section of the stomach is completed, and the abdomen closed. "The size of the growth at or near the pylorus has no influence upon the extent of the resection. For the very smallest growth, a resection to this extent is needed," while for growths invading the body of the stomach subtotal gastrectomy will be necessary.

Deaver[30] tersely expresses his opinion of the value of gastric analysis in the diagnosis of carcinoma of the stomach by calling it a "device which has been invented to defer operation until it is too late." "Cachexia, hæmatemesis, mass, enlarged liver, and anacidity are symptoms not of cancer but of approaching dissolution," and he contends that this fact should be recognized in the text-books of the day. He reports one case in which he operated for recurrence two years after the primary operation of partial gastrectomy; as his patient presented the unusual condition of local recurrence without metastasis, the entire remainder of the stomach was removed, and the jejunum sutured to the œsophagus; a temporary jejunostomy was also done. The patient did well for ten days, but died on the thirteenth day from peritonitis due to leakage at the œsophago-jejunal anastomosis.

Inflammatory Tumours at the Pylorus are often mistaken for carcinoma, and the reverse is sometimes the case; it is sometimes difficult to tell, even after the abdomen has been opened, whether the condition is one of malignancy or not. W. Taylor[31] reports three cases in which a wrong diagnosis was made under these circumstances. In two a benign inflammatory mass was thought to be cancer, and in one of these it was resected; in the other resection was postponed till strength should have followed gastro-enterostomy, but after gastro-enterostomy the tumour vanished and the patient recovered. A third case (hourglass stomach) was also thought cancerous, and gastro-enterostomy and gastroplasty were done as temporary measures, hoping for resection later; but complete recovery occurred without. He urges more resections for suspicious tumours (probably benign, but possibly malignant).

Results of Operations for Gastric Carcinoma.—Daneel[32] analyzed the results of over 400 operations for gastric carcinoma done at the Heidelberg clinique from 1898 to 1905. He concludes that life is *prolonged*, on an average, four months by gastro-enterostomy, fourteen and a half months by gastrectomy. For gastro-enterostomy a Murphy button is habitually used, on the posterior wall if possible, on the anterior if necessary. The anterior operation was done in 9 patients, in 4 of whom a subsequent operation (entero-anastomosis) for vicious circle was required. The general immediate mortality of gastro-enterostomy for cancer was 14·5 per cent.

In the first half of this period only 12·5 per cent of patients could be treated by gastrectomy; but in the second half (1901–1905) this proportion rose to 24 per cent, neither cachexia, old age, nor anæmia diverting them from a radical operation where this was surgically possible. Billroth II. was done in 76 per cent of the cases. Among 73 gastrectomies only one was a total gastrectomy. 11 of these patients were in good health when traced (three years or more after operation).

Resection of the Cardia for Carcinoma.—Wiener,[33] in a patient with carcinoma of the lesser curvature of the stomach invading the cardia, employed osteoplastic resection of the costal arch, and thirty days later, under spinal anæsthesia, excised the growth, doing œsophago-gastrostomy. Death occurred in eleven days from leakage at the site of anastomosis. The fundus of the stomach is a difficult region to expose. In a recent operation for gunshot wound involving thorax and abdomen, and wounding pericardium, diaphragm, liver, cardiac orifice of the stomach, and lung, Astley Ashhurst secured good exposure of the subphrenic space by dividing the 8th left costal cartilage, splitting the diaphragm, and incising the 7th intercostal space; but his patient died of pneumonia on the third day.

Primary Sarcoma of Duodenum.—H. M. Mackenzie[34] reports a case of this rare affection; the patient, a Hindu of 18 years, died of cachexia, without operation, about three weeks after coming under observation.

X Rays in Diagnosis of Gastric Diseases.

Schmieden and Hartel,[35] of Bier's clinique, give their experience, based on an examination of 49 patients, with various gastric lesions. Although they have seen no cases of poisoning from the use of bismuth subnitrate, they now employ "bismuth carbonicum," as suggested by Erich Meyer, because it is non-toxic; and they remove the ingested bismuth broth by lavage as soon as the examination is completed. Every examination includes: (1) Examination of the resting stomach; (2) Examination of the stomach during peristalsis; (3) Re-examination, usually seven hours later; but, for fear of poisoning, this third examination is made only in case the former give doubtful results. The exposures are made with the patient standing; and in most cases the stomach, even when normal, may be clearly differentiated into a *vertical* and a *horizontal* or *ascending* portion.

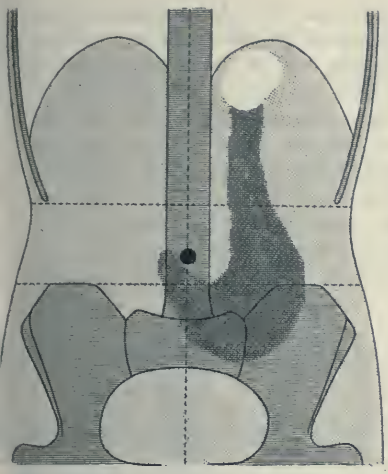

Fig. 84.—Benign stenosis of pylorus. The stomach markedly dilated in its lower part and reaches into lse pelvis. The outline is everywhere sharp. The orizontal part has a distinct upward inclination and nds at the rounded-off pylorus.

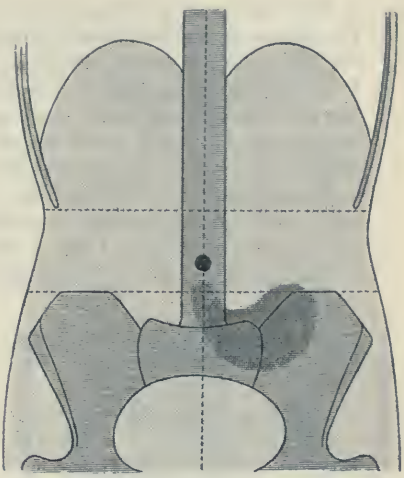

Fig. 85.—Same as *Fig.* 84. Seven hours later; the stomach has not emptied itself yet.

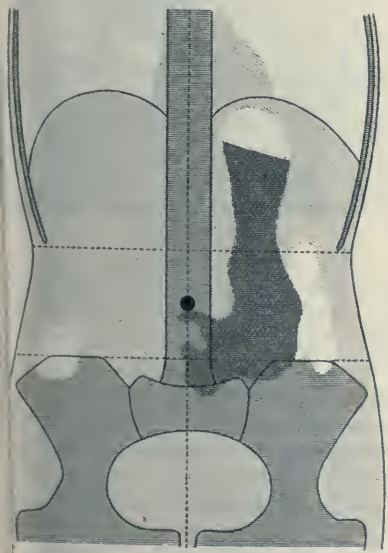

Fig. 86. — Carcinoma of pylorus. Stomach is ted, mostly vertical, reaching to false pelvis. he evidence of peristalsis in walls of vertical part. horizontal part extends to the middle line, and e with a peculiar serrated border (characteristic f carcinoma).

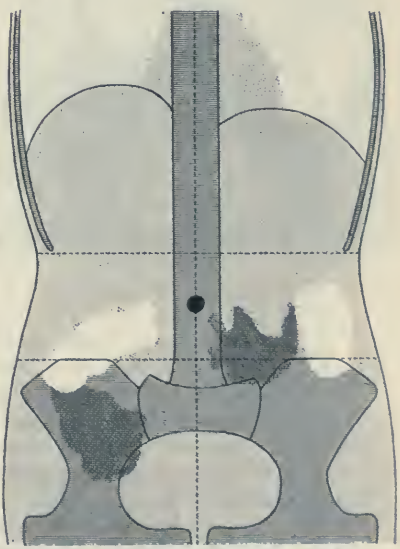

Fig. 87.—Same as *Fig.* 86, six hours later. The stomach has not entirely emptied itself yet. Some bismuth has reached the cæcum. The hepatic and splenic flexures of the colon are full of gas.

The fundus of the stomach usually appears as a clear gaseous area, the bismuth sinking into the median and pyloric portions. Often the colon also appears distended with gas, and is easily distinguished from the bismuth-filled stomach on this account. All that can be hoped from Röntgen ray diagnosis, they acknowledge, is to learn the form of the stomach, and from this to infer the lesion. It is a method which has not, "at least so far," made possible an early diagnosis of carcinoma. It is noteworthy that most if not all of their patients with carcinoma presented a palpable mass, usually significant of an inoperable condition. Their article concludes with a detailed account of the 49 cases, giving skiagraphs (usually several) of each patient.

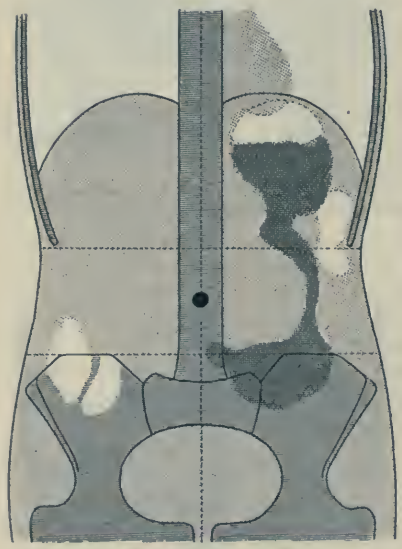

Fig. 88.—Hourglass Stomach.

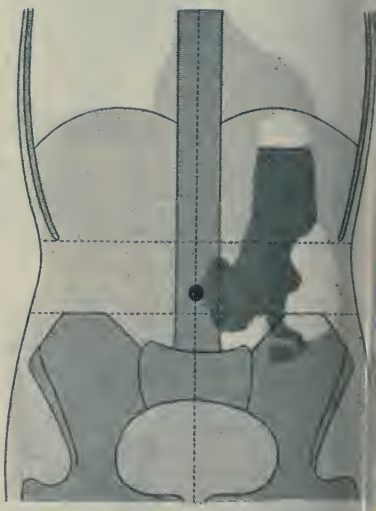

Fig. 89.—Gastric dilatation with gastro-jejunost
The much-dilated stomach is filled, except c
beneath the diaphragm, with the bismuth, and
has already begun to escape by the gastro-intest
anastomosis. The splenic flexure of the colon,
tended with air, compresses the greater curvatur
the stomach.

In no cases, save perhaps those of hourglass stomach, does their X-ray study appear to have enabled them to do more than confirm the clinical diagnosis. Several typical illustrations are here reproduced. The diagrams are thus explained: (*Fig.* 84) White areas represent air-containing viscera. (*Fig.* 85) Light grey represents abdominal organs in general; also the heart. (*Fig.* 86) Grey represents bone. (*Figs.* 87, 88) Darker grey shades represent more or less distinct bismuth shadows. (*Fig.* 89) Black represents navel.

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SUTIKA (The Puerperal Diarrhœa of Bengal). *J. W. W. Stephens, M.D.*

F. Pearse[1] calls attention to the existence of this disease among women after childbirth. The following are the symptoms : Diarrhœa commences within two or three weeks or later after delivery. There is no blood or mucus in the stools, and there is no accompanying pain. The stools are five to fifteen a day, watery or frothy. The affection is probably accompanied by fever. Œdema of the feet is a late symptom. There is no vaginal discharge or other sign of pelvic disease. Death occurs in five to eight months. But little is at present known of the disease, and nothing as to its cause.

Reference.—[1]*Lancet*, Nov. 7, 1908.

SWEATING, LOCALIZED FACIAL. *E. Graham Little, M.D., F.R.C.P.*

Wende and Busch[1] record three cases of a peculiar reflex sweating brought on by the ingestion of certain forms of food. In the first case, the patient, a man aged 54, would develop pronounced local sweating of the nose, upper lips, and temples on eating tomatoes, pickles, cheese, or roast beef. In the second case, a man aged 40, the eating of green onions produced, within thirty seconds, a sweating of the cheek. In the third case, a man aged 42, could produce at will sweating about the eyes, forehead, and upper lip by partaking of peppery or pungent foods. The family history in each of these three cases suggested the existence of an hereditary peculiarity, which in one instance could be traced through four generations. In no case did the symptom show itself before puberty, and the localization of the sweating was the same in response to the same stimuli, in different members of the family.

Reference.—[1]*Jour. Amer. Med. Assoc.* July 17, 1909.

SYPHILIS. *C. F. Marshall, M.Sc., M.D., F.R.C.S.*

Diagnosis.—The detection of the *Spirochæta pallida* has been rendered more easy by the application of the method of lateral illumination on a dark background. By this method (first described by the Rev. J. B. Reade in 1837, then forgotten, and later on rediscovered) the spirochæte can be studied in the living condition under comparatively

low powers. The method consists essentially in the condensation of the lateral rays of light on the object by means of a parabolic condenser, the central rays being cut off by a diaphragm. A layer of cedar oil is placed between the condenser and the glass slide. A strong illumination is necessary, either electric or gas. A glass globe full of water may be placed between the light and the mirror of the microscope to focus the light on the mirror and cut off the heat rays. Slides of definite thickness are necessary, so that the light is focussed on the surface of the slide. The mode of obtaining the material is important. Levaditi[1] mentions the following chief methods: (1) The lesion is cleansed with isotonic saline solution and then scratched lightly with a platinum spatula till clear fluid exudes; hæmorrhage must be avoided, as the red corpuscles reflect the light and illuminate the field; (2) The papule or chancre is incised laterally about 2 mm. from its surface, and the exuding fluid obtained by a pipette; (3) Juice is obtained from the lymphatic glands by a Pravaz syringe, and mixed with saline solution.

Coles[2] uses the following apparatus: A Leitz dark-ground condenser; a Nernst ¼-ampère lamp; a Nelson's aplanatic bull's-eye condenser, or the small arc lamp introduced by Leitz which has a bull's-eye condenser fitted to it; slides and cover-glasses of known thickness; a Zeiss apochromatic $\frac{1}{3}$ objective with compensating ocular No. 18, which gives a magnification of about 560 diameters. Leitz's $\frac{1}{12}$ inch oil-immersion objective may also be used with his dark-ground condenser, provided its N.A. is cut down to 0·9 by a special stop. This has the advantages of increased magnification and brighter image; also the cover-glasses need not be of definite thickness. It is not essential to use apochromatic objectives; the achromatic dry $\frac{1}{6}$ lenses with deep eye-pieces are sufficient, but do not give as good a view as the apochromatics.

The *Spirochætæ pallidæ* appear as silver threads on a black background. (*Plate XLV, Fig. A.*) They possess three movements—rotation on their axis, forward and backward movements, and flexion. The last movement is characteristic. Most other spirochætes, such as *S. refringens* and *S. balanitidis*, are easily distinguished from the *S. pallida* by their greater thickness, refractile character, blunt ends, and more active movements. The spirals are flatter and more irregular. The spirochæte which most closely resembles the *S. pallida* is the *S. dentium*, which is found in the mouth. This resembles the *S. pallida* in its silvery appearance and movements, but is much shorter and has flatter spirals. Coles found *S. pallida* still living after thirty-one days, in cover-glass preparations taken from a primary sore. The spiral form of *S. pallida* is the same during rest and motion, while the spirals of other spirochætes become flattened during rest.

As regards the method of obtaining the material for examination, Coles draws attention to the fact that the spirochætes are found in the deeper parts of the sore, and that the surface contains many kinds of bacteria, including the *S. refringens*, but few *S. pallida*. "The

PLATE XLV

LIVING SPIROCHÆTÆ PALLIDÆ

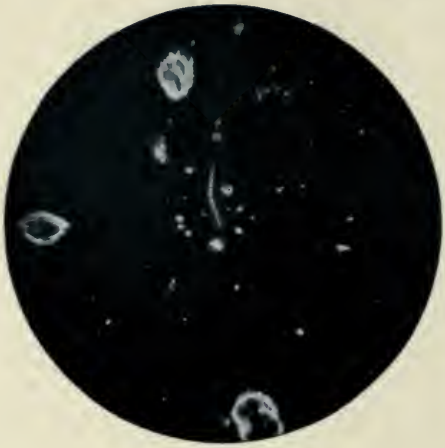

Fig. A

WASSERMANN REACTION TEST

Fig. B

Photo. by Dr. Mucha

surface of a chancre should be thoroughly cleansed with water or saline solution, and then rather firmly rubbed with a little cotton-wool or gently scraped with a knife, needle, or sharp spoon, avoiding bleeding. The few drops of blood which first appear should be removed, and then, after waiting a few seconds, a quantity of clear or slightly blood-stained serum exudes." Cover-glass preparations of this serum ("serum of irritation") are ringed round with vaseline to prevent evaporation and then examined with dark-ground illumination. Preparations are made in the same way from mucous patches and condylomata. Preparations from the indurated glands may be obtained as follows: "The skin over the gland is washed with an antiseptic, shaved, and then rubbed with ether. A syringe with a needle a little larger than that of an ordinary hypodermic is plunged obliquely into the long axis of the gland, which is firmly fixed with the left hand. That the needle is actually in the gland can be ascertained by moving it about, when the gland will simultaneously be felt to move. Whilst the piston is being withdrawn the whole gland is

EXPLANATION OF PLATE XLV.

Fig. A.—Spirochætæ pallidæ seen by dark-ground illumination (× 500).

Fig. B.—The writer gives a schema of the Wassermann reaction, drawn from tests made by J. E. R. McDonagh. The tests were as follows:—

No. 1.—Antigen (extract of syphilitic liver or of guinea-pig's heart) + complement (guinea-pig's serum) + syphilitic serum + inactivated rabbit's serum and sheep's corpuscles.

Control Tests.—No. 2.—Antigen + complement + normal serum + inactivated rabbit's serum and sheep's corpuscles.

No. 3.—Antigen + complement + inactivated rabbit's serum and sheep's corpuscles.

No. 4.—Complement + inactivated rabbit's serum and sheep's corpuscles.

No. 5.—Complement + serum to be tested + inactivated rabbit's serum and sheep's corpuscles.

The first test shows *positive* Wassermann reaction, or no hæmolysis. Corpuscles are unaltered, and sink to the bottom of the tube. All the other or control tests show total hæmolysis of the corpuscles, or *negative* Wassermann reaction.

massaged or squeezed with the left hand. In this way a few drops, probably only enough to fill the needle, are withdrawn. Cover-glass and film preparations are then made from this blood-stained fluid, and examined in the fresh and stained condition." Preiss[3] says that the spirochætes can always be found in this way during the period between induration of the glands and the first secondary eruption, and he recommends that gland puncture should always be performed in cases where examination of the chancre is negative. Preparations can be obtained from the roseola eruption by scraping the surface gently, avoiding bleeding as far as possible.

Examination of Stained Preparations.—Coles points out that the *S. pallida* can be stained by many of the ordinary aniline dyes, as well as by the Giemsa stain. However, Giemsa's or Leishman's stains are the best, as they differentiate the *S. pallida* more clearly from other spirochætes. Preparations are stained for half an hour, then gently washed in distilled water, dried, and mounted in balsam, or examined by oil immersion. Spirochætes examined in stained preparations are

found to average 6 to 15 μ in length and $\frac{1}{4}$ μ in thickness. The spirals are very regular, deep, and closely approximated, and vary in number from six to twenty-two. The distance between the spirals is very constant—1 to 1·2 μ. The spirals can be roughly measured by comparing them with a red blood corpuscle, which averages 7·5 μ in diameter.

Geraghty[4] points out the practical value of the demonstration of the *S. pallida* in the early diagnosis of syphilis, especially in the case of doubtful chancres. He remarks that "those who see many venereal sores realize that in a great number of cases it is impossible to distinguish between chancroid and chancre. The time element is seldom of any value, so that the period of incubation cannot be determined. The syphilitic sore may be nothing more than a tiny abrasion lasting only a few days, and no suspicion of its true character entertained until it is subsequently revealed by the development of secondaries. Again and again we have seen apparently typical chancroids which afterwards proved to be syphilitic." In several cases the *S. pallida* was found in sores which had not the clinical appearance of syphilitic chancres, but which proved subsequently to be syphilitic.

Bottelli[5] has introduced a rapid method of staining the *S. pallida* by Marino blue. Like the Giemsa stain, this is a modification of the method of Romanowsky, consisting in the association of azur, methylene blue, and eosin. Marino blue is a powder soluble in water and in methyl alcohol. A solution of 1 gram in 135 of methyl alcohol is used. The preparation to be examined is dried but not fixed; it is then covered with the staining fluid for two or three minutes; a 1–20,000 solution of eosin is thus added drop by drop to the blue solution; after two minutes the preparation is washed, dried, and mounted in balsam. Marino blue loses its properties when kept for some time, and must therefore be prepared in small quantities.

Comandon[6] has introduced a method of staining fresh preparations with silver nitrate. A solution of albumin (50 per cent) is added to the preparation, which is then fixed in the flame, placed in silver nitrate (10 per cent), and exposed to the light for five minutes till it turns brown. It is then washed in water and developed with pyrogallic acid (5 per cent); then washed, dried, and mounted in balsam. The spirochætes appear black on a brown ground.

Serum Diagnosis.—The method of serum diagnosis (*Plate XLV, Fig. B*), based on the Bordet-Gengou phenomenon, introduced by Wassermann, Neisser, and Bruck,[7] has been investigated by numerous observers. Bruck says that although the intimate nature of the reaction is not yet settled, everyone is agreed as to its practical importance. It is true that the test cannot now be regarded as absolutely specific for syphilis, since positive reactions have been obtained in other diseases. On this point Levaditi[8] remarks: "Along with syphilis must be placed on the one hand leprosy, on the other hand certain infections caused by protozoa, especially trypanosomiasis, piroplasmosis, and perhaps palludism. It is none the less true that these exceptions do not rob

the method of its practical value as regards the diagnosis of syphilis." Mucha, Eichelberg, and others have reported positive reactions in cases of scarlet fever, which suggested the possible protozoal origin of this disease; but Bruck, Wassermann, and others have failed to obtain positive results in scarlet fever. Butler[9] has obtained the reaction in cases of noma, which is said to be caused by a spirillum. Framboesia or yaws has also been said to give the reaction. Swift[10] suggests that the Wassermann reaction may be a group reaction caused by protozoan parasites. In most of the above cases there is no difficulty in differential diagnosis, so that the value of the method in the diagnosis of syphilis is not diminished.

In primary syphilis Bruck found a positive reaction in about 50 per cent of cases; in secondary syphilis in 90 per cent; in tertiary syphilis in 70 per cent, and in latent syphilis in 50 per cent. He points out that a positive reaction in primary syphilis shows that the infection has become generalized. Levaditi and Yamanouchi[11] showed that the reaction becomes positive when cutaneous immunity is established; i.e., when re-inoculation fails. Bruck points out that as antibodies only appear in the blood when the virus is still present, a positive reaction in latent syphilis signifies that the patient is still syphilitic.

Lesser,[12] Blaschko,[13] and H. F. Swift[10] report a long series of examinations, and give statistics of the reaction. Bruck obtained positive reactions in monkeys inoculated with syphilis, before any sign of a primary sore appeared, and states that the same has been reported in man. Swift thinks the serum test of more value than the therapeutic test in cases of doubtful diagnosis. Lesser points out the similarity between the results of the serum test and those of the post-mortem room. He found post-mortem evidence of visceral syphilis in 49 per cent of cases with a previous history of syphilis, while the serum test was positive in 46 per cent of cases of latent syphilis. These figures suggest that visceral syphilis may be present in so-called latent cases.

As regards the *relation of the reaction to treatment*, it was shown by Bruck and Stern[14] that cases which had undergone treatment gave a much lower percentage of positive results than untreated cases. More recently this point has been investigated by Citron, Lesser, Blaschko, and others. Lesser[12] found that energetic treatment was required to transform a positive into a negative reaction. With ordinary doses this transformation only occurred in 35 per cent of cases. He obtained it in some cases after treatment with potassium iodide. In congenital syphilis the transformation was not obtained. Alcohol appears to prevent it. Lesser mentions cases in which there were no symptoms of syphilis and the serum test was negative, but the recurrence of syphilitic symptoms was accompanied by a positive serum reaction. An interesting case was one treated three years previously for suspected syphilis; on the strength of a positive serum reaction another course was given, during which a syphilide developed. Blaschko[13] reports ninety cases in which he studied the

effect of different kinds of treatment on the reaction. He found the changes from a positive to a negative reaction similar in all stages of the disease. In some cases where the positive reaction disappeared during treatment, it returned when the latter was discontinued for some weeks.

It is too early yet to expect the reaction to decide the relative merits of the different forms of mercurial treatment, but, according to Swift,[10] the reaction changes more rapidly after mercurial inunction and injections than after ingestion by the mouth. As Swift remarks, a negative reaction after three months' treatment does not indicate that sufficient mercury has been administered. Prolonged treatment should be given, and the serum should be tested from time to time. Most cases well treated give a negative reaction, but in some the reaction remains positive in spite of treatment; these cases are likely to have tertiary syphilis. Such cases should be treated till the reaction becomes negative. Swift advises that the serum test should be made from time to time even in well-treated cases which give a negative reaction, as a positive reaction may be the first sign of a relapse; as it was in a case he mentions.

Citron[15] lays down the two following laws: (1) The longer the syphilitic virus has acted in the body, and the oftener it has caused recurrences, the more constant and stronger is the antibody content of the serum; (2) The earlier mercurial treatment is started, the longer it is continued, the more frequently it is repeated, and the shorter the interval since the last course of treatment, the less is the antibody content of the serum, and the greater the frequency of a negative reaction.

Bassett Smith[16] found that mercurial treatment did not appear to change the reaction as long as symptoms were present.

Butler[9] sums up the significance of the reaction with regard to therapeutics as follows: If we accept a positive reaction as an indication of active syphilis, it follows that a positive reaction is an indication for antisyphilitic treatment. On the other hand, treatment should not be discontinued on the strength of the disappearance of the positive reaction, because we know that it may again become positive. Bruck[7] states that even cases which have been thoroughly treated may continue to give a positive reaction; also that a negative reaction occurs in about 10 per cent of cases of syphilis, and proves neither the absence nor the cure of syphilis. With regard to the question whether a patient showing a positive reaction should be allowed to marry, Bruck considers that we should endeavour to obtain a negative reaction by energetic treatment, but experience shows that such patients are not dangerous to their wives, and may have healthy children. McIntosh[17] considers that a positive reaction is an indication for energetic treatment, without waiting for further symptoms, but that it is impossible at present to give a definite opinion as to the influence of treatment on the reaction, nor to what extent the reaction can be used to indicate whether treatment has been

sufficient, as the results seem to be too variable ; all we can say is that the more complete the treatment, the less likely is the reaction to be positive some two years after infection.

The Wassermann reaction has thrown light on many of the *problems of syphilology*, especially with regard to *Colles's and Profeta's laws*. Bauer[18] examined the serum of both mothers and infants. The mother's serum almost always gave a positive reaction, and in every case where the serum of the new-born infant showed a positive reaction, signs of congenital syphilis appeared later. This shows that the apparently healthy mothers of syphilitic infants are not immunized, but are affected with latent syphilis. As regards the so-called law of Profeta, Bauer is of opinion that there is latent syphilis in the infant, which may manifest itself later on. Bar and Daunay[19] have also studied this question, and draw attention to the importance of the reaction in obstetric practice. They conclude that the reaction is not always positive in all pregnant syphilitic women, but that it is only positive in syphilitic women. A positive Wassermann reaction in a pregnant woman contraindicates the employment of a wet-nurse for the child. Citron[20] has applied the Wassermann reaction to cases of *aortic disease*. He obtained a positive result in 62 per cent of cases of aortic disease in which the history of syphilis was doubtful or negative.

The syphilitic origin of *tabes* and *general paralysis* has received further confirmation by the serum test. Wassermann and Plaut[21] obtained a positive reaction with the cerebrospinal fluid in 88 per cent of general paralytics. Smith and Candler[22] report 92 per cent positive reactions (personal), and 87 per cent (from literature) in general paralysis ; 50 per cent from cerebrospinal fluid and 71 per cent from serum in tabes (from literature). Levaditi[8] remarks that the syphilitic origin of other obscure diseases of the central nervous system may be revealed by a positive Wassermann reaction of the cerebrospinal fluid. On this point Mott[23] warns us against confounding coincidence with cause. The Wassermann reaction has also proved useful in the differential diagnosis between syphilis and malignant tumours, and in diseases of the eye. Butler[9] draws attention to the value of the serum reaction in the diagnosis of visceral syphilis, and especially in the diagnosis of the meso-aortitis which precedes the formation of aneurysm. Purckhauer[24] obtained a positive reaction in ten out of twelve cases of leucoplakia, thus supporting the syphilitic nature of this affection. Bassett Smith[16] found a positive reaction in almost all cases of primary syphilis, sometimes as early as the fourteenth day. In many cases admitted for soft chancre the presence of double infection with syphilis and soft chancre was indicated by the test.

Marie,[25] Landsteiner,[26] Porges and Meier,[27] and Levaditi and Yamanouchi[28] have made a series of interesting experiments concerning the hypothesis of the Wassermann reaction. It appears from their conclusions that the reaction cannot be attributed to the intervention

of antibodies and antigens in the true sense of the word. According to Levaditi,[9] the active principle in extract of syphilitic liver is not a specific substance derived from the *Spirochæta pallida*, but simply a mixture of lipoids and bile salts, i.e., substances which exist in the normal organ. He considers that, under the influence of syphilitic infection, the blood serum undergoes some change in constitution which renders it easily precipitable by lipoids, and also by other fairly well-defined colloidal substances. The absorption of the complement in the Wassermann reaction may thus be explained by the fixation of this complement on the colloidal precipitate which is formed when syphilitic serum comes in contact with lipoids, bile salts, etc. If this is true, the differences between syphilitic and normal serum when tested by the Wassermann reaction are not qualitative but quantitative, the phenomenon being caused by substances of histogenetic origin, rather than by products derived from the *S. pallida*. Levaditi thinks it probable that the syphilitic virus, acting on the hæmatopoietic organs, and perhaps also on the skin and mucous membranes, sets at liberty the lipoids and globulins, which accumulate in the serum and render it more easily precipitable than normal serum.

McIntosh[17] concludes: (1) That Wassermann's reaction possesses a sufficient degree of specificity to make it of considerable value from a diagnostic and therapeutic point of view; (2) That certain extracts of congenital syphilitic livers give the most consistent results; (3) That a marked positive result is a certain sign of syphilis, but a negative result does not always mean that syphilis does not exist or has not existed.

Browning and McKenzie[29] conclude that a positive result indicates that the serum proceeds from a subject infected with syphilis, yaws, or trypanosomiasis. It is not known whether the changes in the last two diseases are as constant as in syphilis. At any rate, in temperate zones a positive reaction practically signifies syphilis. Negative reactions which have been recorded in cases of active syphilis are probably due to causes which have not been completely analyzed. It is not yet possible to say whether a positive reaction signifies living spirochætes. The reaction does not become distinct till some time after the appearance of the primary sore, but is present afterwards at all stages in cases presenting definite lesions. On the other hand, during latent periods 50 per cent of cases react negatively. This may mean that the reacting substances are not elaborated and set free in the serum so long as equilibrium exists between the spirochæte and the tissues.

McDonagh, Müller and Morawetz[30] have made 5000 examinations, and obtained 30 to 40 per cent positive reactions in primary syphilis, 85 per cent in secondary, and 70 per cent in tertiary syphilis. Young chancres did not give a positive reaction. They state that positive reactions are obtained in aneurysm, aortitis, and general arteriosclerosis. They mention that leprosy gives a positive reaction in the tubercular stage, but not in the macular; that leprosy also reacts

to tuberculin, while syphilis does not; that this points to the Wassermann reaction being a chemical one, and to syphilis containing a substance similar to leprosy. They also state that dourine gives a positive reaction. They do not consider the modifications of the Wassermann test as reliable as the original.

Modifications of the Wassermann Reaction.—Fleming[31] remarks on the disadvantages of Wassermann's method, depending on its elaborate technique. This was modified by Bauer,[32] who made use of the fact that there is in human serum a hæmolytic amboceptor for sheep's corpuscles, thus avoiding the use of the hæmolytic rabbits' serum. Hecht[33] went further, and used the natural hæmolytic amboceptor for sheep's corpuscles present in human serum, and also, as complement, that present in fresh human serum. He thus made the serum to be tested supply the complement as well as the hæmolytic amboceptor. Fleming has introduced a simple method, using (1) alcoholic extract of heart muscle, (2) serum to be tested, (3) sheep's corpuscles. This method is based essentially on that of Hecht, as the serum to be tested supplies both complement and hæmolytic amboceptor, but the technique is said to be simpler and more suitable for clinical work. Fleming claims that the results are as good as those obtained by the more complicated Wassermann method, and concludes that (1) The method described is a clinical method requiring only the preparation of a suitable tissue extract and an elementary knowledge of laboratory methods; (2) The reaction is positive in almost all cases of syphilis in the secondary and tertiary periods, and in congenital syphilis; (3) In primary syphilis the reaction may fail to appear; (4) In cases after treatment the reaction may be negative, probably indicating the disappearance of the infection; (5) The only other disease giving a positive reaction was leprosy. For the details of Fleming's technique the reader is referred to the original article.

Bassett Smith[16] considers Fleming's method less reliable than Wassermann's original technique, in which each factor is standardized before use. Mott[34] also regards the original method of Wassermann as the most specific and the most reliable. McIntosh[17] remarks that "many modifications of Wassermann's reaction have been suggested, chiefly for the purpose of simplifying the technique, but most of these have little to recommend them, and at present it does not seem likely that any modification which could be done outside a well-equipped laboratory could have any practical value." He points out an objection to the use of the amboceptor for sheep's corpuscles normally present in human serum, in the fact that this natural amboceptor varies considerably, and in some cases is absent, so that the serum of such an individual could not be tested by this method.

Treatment.—Neisser,[35] while insisting on the fact that mercury should not be replaced by arsenic, speaks favourably of the treatment of syphilis by **Atoxyl** and **Arsacetin.** The latter drug, introduced by Ehrlich, is said to be the sodium salt of para-amino-phenyl-arsenic acid (sodium acetyl-para-amido-phenyl arsonate).

Compared with atoxyl, arsacetin is said to be less toxic, more stable, and of equal therapeutic power. The danger of optic atrophy, which was a great disadvantage with atoxyl (said to be due to impurities), is absent with arsacetin. However, arsacetin is said to be contraindicated when there are parenchymatous organic changes. Neisser showed by experiments on apes that arsenic, in the form of atoxyl or arsacetin can destroy the syphilitic virus without producing toxic effects. Arsenious acid and the cacodylates were useless for this purpose. His experiments showed that atoxyl and arsacetin have (in apes) both a preventive and curative action. The preventive action was shown by commencing treatment five to seven days after inoculation. All the animals remained healthy when the drug was given in sufficient doses. The proved value of mercury contra-indicates its replacement by a new drug the action of which is less well known, but the results of experiments on animals show that arsacetin and atoxyl may be tried with advantage in man. Neisser recommends simultaneous or alternate treatment by **Mercury and Arsenic.** He gives injections of 0·6 gram of arsacetin on two consecutive days every week for periods of ten weeks. The solution used may be 10 or 15 per cent; in the latter case it must be warmed, as arsacetin is precipitated in the cold. It may also be given internally.

Lambkin[36] reports his further experience of the treatment of syphilis by **Arylarsonates.** He agrees with Neisser that mercury is even more fully established than ever as the specific for syphilis, and that arsenic cannot be compared with it as regards curative effects; but he considers that the arylarsonates are indicated in cases which are intolerant of mercury, or which resist it in any form. During the last two years he has treated 130 cases of syphilis with arsenic, including all stages, from primary chancres to cases showing signs of tabes. The most striking effects were seen in cases of old syphilis with constant recurrences in spite of mercurial treatment, and breakdown of general health. Comparing the three drugs, **Atoxyl, Soamin,** and **Arsacetin,** Lambkin has abandoned atoxyl—the original arsenical compound used for sleeping-sickness and later for syphilis—owing to its unstable composition and the danger of optic atrophy. The second drug, soamin, introduced by Messrs. Burroughs & Wellcome, is sodium amino-pheny-arsonate, and almost identical with atoxyl; but it is of more stable composition and hence safer to use. It has, however, the disadvantage of decomposing when kept for any time, and hence requires to be freshly prepared daily. Soamin was given in doses of 10 gr. every second day up to a total of 100 gr. The third drug, arsacetin, is more stable and less toxic than atoxyl or soamin, and does not decompose when kept or when boiled. Lambkin gives injections of 40 min. of a 15 per cent solution of arsacetin (8 gr.) on alternate days up to a total of 100 gr. The 15 per cent solution of arsacetin requires to be heated before use, as it deposits the salt when cold. Lambkin prefers arsacetin to the other compounds of arsenic. As a rule he uses it alone, but in some cases in conjunction with

mercury. Many cases of syphilis which respond readily to mercury or arsenic may be totally unaffected by the other. He considers the arylarsonates contraindicated in cases showing signs of cardiac or renal organic disease. He gives a second course of arylarsonates after three months' interval, and a third course after six months. As regards the prophylactic action of the arylarsonates, stated by Metchnikoff, Lambkin has tried it in the army, but the injections did not prevent further development of the disease. As regards the future of the arylarsonates, Lambkin does not consider that they will supersede mercury, but that they will be used in cases which resist the action of mercury, in those which are intolerant of mercury in any form, and where the patient is debilitated or broken down in health from climatic or tropical influences, especially by malaria.

Heymann's[37] experience of arsacetin is less favourable. He treated cases of primary, secondary, and tertiary syphilis, but although the lesions rapidly disappeared under the treatment, recurrences took place within two weeks, and repetition of the treatment produced no effect, necessitating recourse to mercurial treatment. Moreover, in seven cases the arsacetin had to be discontinued owing to toxic effects (headache, nausea, oliguria, albuminuria, hæmaturia, etc.). He therefore concludes that it has a temporary effect in removing the symptoms of syphilis, but that its action is not durable. Major French[38] also found that relapses after arsacetin treatment were common. He concludes that arsacetin has a general tonic effect, like quinine, iron, phosphorus, cod-liver oil, etc.; that it should not replace mercury in the treatment of early syphilis, but should be used either in conjunction with mercury, or after the first course of mercurial treatment. French has had good results from the old combination of mercury and arsenic in the form of **Donovan's Solution,** in cases of early tertiary syphilis. He points out that the temporary removal of skin lesions in syphilis is not necessarily a sign of cure, since nature often effects this without any drug. The test of benefit in early syphilis is the rapid reduction of induration in the chancre and lymphatic glands, and he considers that this effect is produced more readily by mercury than arsenic.

With regard to the action of arsenic in syphilis, it is interesting to note that Volk,[39] by means of microscopic examination with dark-ground illumination, found that even concentrated solutions of atoxyl had no effect on the motility of the spirochætes.

Moore[40] points out that there is much confusion in the nomenclature of the new arsenical preparations, and states that soamin and atoxyl are identical, both being sodium amino-phenyl-arsonate. Soamin is the trade name for Burroughs & Wellcome's preparation, atoxyl for that of the German firms. The drug is the sodium salt of para-amino-phenyl-arsenic acid, first discovered by a French chemist, Béchamp, over fifty years ago, and reintroduced under the name of atoxyl. It was used in certain skin affections, but abandoned, owing to the toxic effects of impurities, which sometimes caused blindness.

Its use was revived when it was found to have a destructive action on trypanosomes. Further confusion has been added by another new name—**Orsudan**—which is apparently the same as arsacetin.

Gaucher[41] is not in favour of the treatment of syphilis by arsenic. In a clinical lecture on the *general treatment of syphilis*, he remarks that " there are only two drugs for syphilis ; a capital drug, **Mercury**, an accessory drug, **Iodide of Potassium.** To these two primordial drugs must be added a third, an auxiliary drug, **Sulphur,** which utilizes and eliminates mercury. Gold, arsenic, antimony, quinine, uranium, and their compounds, and organic serums have no curative action on syphilis. These substances are not only useless but sometimes dangerous ; for example, that preparation of arsenic known as atoxyl, which causes visual troubles and even blindness." For mercurial treatment, Gaucher prefers soluble salts, whether given by ingestion or by subcutaneous injection. He regards treatment by insoluble salts as " a blind, dangerous method, the effects of which cannot be measured." To this rule he makes one exception ; viz., the use of **Tannate of Mercury** in cases of syphilitic nephritis, as this drug does less harm to the kidney. Owing to the small amount of mercury contained in the tannate, this drug can be used to test renal elimination without danger of mercurial intoxication. Five centigrams of tannate are equivalent to one of sublimate. One pill of 1 cgram daily causes no inconvenience. In all cases of syphilis, with or without nephritis, it is advisable, before giving large doses of mercury, to test the elimination of mercury by the urine, and also to determine the nitrogenous excretion. In the ordinary treatment of syphilis, Gaucher prefers **Sublimate Pills** (1 cgram) or **Lactate of Mercury** by the mouth. The lactate of mercury is especially recommended for children. It is given in the form of a 1–1000 solution, 10 drops for an infant, up to a teaspoonful for a child of two or three years. In adults 5 teaspoonfuls may be given (equivalent to about 2 cgrams of sublimate). Gaucher's routine treatment of syphilis is by sublimate pills. When injections are necessary he prefers **Benzoate** or **Biniodide of Mercury,** in 1 per cent solutions. Treatment by injections is indicated in all severe cases of syphilis, especially those of phagedænic chancre, tubercular or ulcerative syphilides, perforating gumma of the palate, cerebral and spinal syphilis, etc. It is also useful to begin treatment by injections during the most virulent period of infection, even without severe manifestations. They may also be used when there is gastric intolerance to mercury, but in this case mercurial inunction is preferable. Gaucher condemns injection of grey oil, on the grounds that it is dangerous, and less efficacious than pills. He has observed ten cases of gangrene of the mouth and pharynx following the use of grey-oil injections, of which eight were fatal. Further, Gaucher regards all insoluble injections as dangerous, and mentions cases of fatal ulcerative colitis following injections of salicylate of mercury and calomel. When a patient cannot tolerate mercury by the stomach, and when daily injections of soluble salts are inconvenient, Gaucher has recourse to

Inunction. In this method mercury is absorbed partly by the cutaneous glands and partly in the form of vapour by the respiratory tract. Gaucher recommends four or five grams of grey ointment to be rubbed into the axillæ and groins alternately for twenty minutes daily for twenty days. The therapeutic effect of twenty inunctions of 5 grams is equivalent to thirty days of sublimate pills, two pills of 2 cgrams. daily. Gaucher gives mercurial treatment for four years, commencing as soon as the diagnosis is certain by detection of the spirochæte by means of the "ultramicroscope" (lateral illumination on dark ground). He begins with a series of fifteen daily injections of 2 cc. (2 cgrams) of solution of benzoate of mercury (1 per cent). This is followed, without any interval, by six weeks' treatment by pills—two pills of 1 cgram of sublimate daily. An interval of one month's rest follows, provided no symptoms occur. After this the treatment is continued every other month for the first two years; then one month in three during the third year, and one month in four during the fourth year; always provided that no manifestations occur during the intervals. If symptoms occur during these intervals, treatment is continued.

With regard to the *preventive* action of mercury, Gaucher regards this as doubtful in acquired syphilis, but admits that it has an undoubted preventive action in inherited syphilis. "It is owing to the manifest action of mercurial treatment as a preventive of inherited syphilis that I prescribe for all syphilitics a month's mercurial treatment before marriage, and for syphilitic women, or the wives of syphilitic men, mercurial treatment for three weeks every month during the whole course of pregnancy." [This statement, coming from such high authority, is opportune, in the light of the recent denial, on insufficient grounds, of the possibility of the paternal transmission of syphilis.] Gaucher does not agree with Fournier that mercurial treatment prevents tertiary syphilis: "The best conducted treatment at the commencement and during the secondary period of syphilis does not prevent tertiary lesions, when this syphilis is capable of producing them. There are as many tertiary manifestations among syphilitics who have been well treated as among those who have been little treated." As regards tabes and general paralysis, he states that they occur as often in treated as in non-treated patients. He therefore concludes that mercury has a curative action on syphilitic lesions, but is not preventive of further lesions. With regard to **Iodide of Potassium,** Gaucher points out that it is nothing more than an adjuvant to mercury, and by no means a specific for tertiary syphilis, as many suppose. Iodides are useful, in conjunction with mercury, in some cases of primary and secondary, as well as in tertiary syphilis. A combination of iodide with mercury is indicated in cases of exuberant and phagedænic chancre, in tubercular or ulcerative syphilides, in gummata, in arteritis, in cerebral and spinal syphilis, osteitis, periostitis, and as a rule in all severe cases of syphilis. Gaucher considers that the action is due to the alkaline iodide and not to the

iodine. Iodide of sodium is as efficacious as iodide of potassium, but metallic iodine, or the organic preparations of iodine, have no appreciable action. Iodides are usually given in doses of 1 to 2 grams daily, rarely more than 4 or 5. As iodides have no preventive action, it is useless to give them in the absence of actual lesions. Iodides should not be given in syphilis of the larynx or in ocular syphilis, and only with caution in renal syphilis. The action of **Sulphur** in syphilis is that of an eliminator of mercury. The sulphur compounds, especially sulphuretted hydrogen, redissolve the sublimate which has combined with albumin in the body to form an insoluble albuminate of mercury. Sulphur is administered either in the form of natural water from sulphur springs, or as an artificial sulphur water—silicate of sodium 0·1, monosulphide of sodium 0·15, sulphate of sodium 3, chloride of sodium 6·5 grams, dissolved in a litre of water. Sulphur tends to prevent stomatitis and other toxic effects of mercury, and is therefore useful when large doses are prescribed, and when the patient is saturated with mercury. In these cases the sulphur dissolves the mercury fixed in the tissues, as is shown by analysis of the urine.

Christian[42] prefers treatment by inunction and ingestion, and is not in favour of mercurial injections in any form. Whenever possible, he advises treatment to be commenced with daily inunction for twenty days. After this the patient takes mercury internally, preferably in the form of **Protoiodide Pills** ($\frac{1}{3}$ gr. thrice daily). He considers biniodide and perchloride of mercury inferior to protoiodide for routine treatment. The **Nucleinate of Mercury** is useful when given alternately with protoiodide, or when other preparations of mercury are not well tolerated (1 gr. three or four times daily). Grey powder is not considered as active as protoiodide, and is reserved for cases in which the latter causes diarrhœa. During the first year it is well to give two or three courses of inunction. Inunction is also indicated if severe symptoms arise. Treatment should be continued for four or five years, whether symptoms occur or not, and a course of inunction should be given every spring. Tertiary syphilis is treated by mercurial inunction and potassium iodide, 10 to 20 gr. thrice daily. Christian has not much confidence in the new arsenical preparations, and thinks that mercury will long remain the specific remedy for secondary and tertiary syphilis.

In spite of the objections raised by Gaucher, treatment by injection of insoluble preparations of mercury appears to be gaining in favour. Duhot,[43] during the last three years, has made 22,500 injections of grey oil without any serious accident. The partisans of this method object to the soluble preparations, partly because of the necessity of daily injections, also because the mercury soon disappears from the system. They also consider that the dangers of the insoluble salts have been exaggerated. Lieven,[44] of Aix-la-Chapelle, uses **Calomel, Grey Oil,** and **Salicylate of Mercury.** The first two are injected in a strength of 40 per cent once a week by means of a Barthélemy's syringe.

One division of this syringe contains 1 cgram of the preparation: this syringe is indispensable for calomel and grey oil, as it is impossible to give exact doses with the usual Pravaz syringe. Six to eight injections of calomel, ten to twelve of grey oil, are sufficient for a course of treatment. Salicylate may be given by Pravaz syringe (1 cc. or 15 min.) for a course of eight to ten injections. The most effective preparation is calomel, but it has the disadvantages of (1) Pain, although this may be diminished by analgesic suspension media; (2) Aseptic abscesses; (3) Fatal results from the calomel lying dormant for a time and then becoming suddenly absorbed. Lieven therefore reserves calomel for severe cases in which a rapid result is required, and prefers salicylate of mercury for routine treatment. Injections are contraindicated in Bright's disease and diabetes. Lieven also recommends **Inunction,** which is carried out at Aix as follows: 4 to 5 grams of 33 per cent grey ointment are rubbed in by the patient himself for twenty minutes, after which the skin should appear dry and not shiny. On the first day both calves are rubbed; on the second day the left, on the third day the right thigh; on the fourth day the abdomen and flanks; on the fifth day both arms. During these five days no bath is taken, and there is no change of underwear. On the sixth day the whole body is washed with soap. These courses of five days are repeated till the requisite number of rubbings has been given. Larger quantities of mercury can be tolerated by means of sulphur baths (at 95° F.) preceding the rubbing. The baths and drinking waters promote metabolism, thus giving the mercury an opportunity to enter into new combinations with fresh albumin. Stomatitis and colitis may occur in any form of mercurial treatment, but they can be prevented by careful attention to the mouth and bowels. During the cure the teeth should be cleansed with a paste of salol and chlorate of potash after each meal, and the mouth should be rinsed every hour with a solution of aluminium acetico-tartaricum. Mercurial ulcerations are cured by the application of a concentrated solution of chromic acid. The bowels require regulation, which is generally effected by sulphur waters. Diarrhœa is stopped by removing the ointment and prescribing opium. Lieven regards iodide of potassium as superior to other preparations of iodine. He finds it useful in the vegetating patches of secondary, as well as in tertiary syphilis. For iodism he recommends 15 gr. of sulphanilic acid daily. When the patient cannot tolerate iodides he prescribes **Sajodine,** three to eight tablets of ½ gram daily. This has a milder effect, and is more slowly eliminated, than iodide. The same applies to subcutaneous injections of **Iodipin,** in doses of 20 to 30 grams three times a week, the total course being 250 grams.

Lieven does not recommend treatment by the new preparations of arsenic, and considers that their therapeutic value is still *sub judice*. His usual course of treatment consists in forty to fifty inunctions of 5 grams. If the patient tolerates mercury well, two rubbings per day

are given during the last fortnight. If he is anæmic, injections of sodium arsenate are given three or four times a week. The mouth should be attended to for a fortnight after each course. Three further courses of inunction follow at intervals of six months. If a relapse occurs during the first year of treatment, the fourth course may be postponed till the end of the second year. If inunction is impossible owing to irritability of the skin, or for social reasons, it is replaced by eight or ten injections of salicylate of mercury in vasenol. When inunction is impossible and injections are not tolerated, he gives internal treatment in the form of **Tannate of Mercury** pills (1 decigram thrice daily). These are taken for six weeks, followed by an interval of two months' rest, for a period of two years.

As regards the local treatment of syphilis of the mouth, nose, and throat, this can often be dispensed with, as the lesions usually yield to general treatment. Ulcerated patches may be touched with concentrated solution of **Chromic Acid.** If after an energetic course of treatment a relapse occurs, with secondary symptoms on the mucosa, it is not wise to give another full course of treatment at once. If the lesions do not yield to local treatment, an intermediate mild course of treatment may be given, such as a mercolint flannel on the chest, or tannate of mercury pills, till the time arrives for the next course of inunction. Smoking is a common cause of relapsing lesions in the mouth and throat. At the end of the first year Lieven prescribes iodides, 10 gr. thrice daily for three or four weeks; or injections of iodipin. In ulcerated tertiary lesions he gives iodides alone for four or five days, followed by inunction when healing commences. After the ulcers are healed, iodide is stopped, and iodipin injections are employed, while the rubbings are continued. The combination of inunction with iodipin injections tends to prevent relapses, which iodide of potassium often fails to do. Malignant cases of syphilis are often refractory to ordinary treatment by mercury and iodides; in such cases Lieven has had good results from **Calomel Injections.**

Klotz[45] also recommends insoluble injections, especially **Salicylate of Mercury** and **Calomel.** He remarks that the tertiary manifestations of syphilis can usually be as successfully treated by mercury alone as by iodides alone or in combination with mercury, and in many cases they are influenced by strong mercurial treatment when iodides and mixed treatment have failed. "It is therefore advisable, in clearly syphilitic manifestations, not to cease specific treatment, and in doubtful cases not to dismiss the diagnosis of syphilis until such strong mercurial treatment has been sufficiently applied, as offered by the intramuscular injections of insoluble mercurial preparations, of which calomel is the most reliable." As Klotz points out, the presence of the spirochæte in tertiary lesions, and the demonstration of the action of mercury on this microbe, support the treatment of tertiary syphilis by mercury.

Pugin Meldon[46] says that the pain caused by the injection of grey oil and calomel is diminished by using 20 per cent of **"Creo-camph"**—

a mixture of equal parts of creosote and camphoric acid. With regard to the arsenical treatment of syphilis, he remarks that it will be some years before the efficacy of this method can be proved, but thinks it is justified in the following conditions: (1) When mercury cannot be tolerated in sufficient amount to relieve the symptoms, especially in cases of extensive ulceration of the mouth and throat; (2) In cases of syphilis combined with tuberculosis.

Zieler[47] points out that the liquid paraffin used in the preparation of grey oil has the objection of being unabsorbable. This objection is removed by substituting **Oleum Dericini,** which is castor oil obtained at high temperature and therefore sterile. It is capable of being absorbed. He uses the following formula in Neisser's clinic: Hydrarg. puriss. bidestill. 40 grams; lanolin. puriss. steril., 15 grams; ol. dericini steril., 45 grams. The mercury is first carefully rubbed with the lanolin until an equal and fine emulsion is obtained, and then the oil is gradually added. When properly carried out, the preparation yields mercury globules of equal size, varying between $\frac{1}{4}$ and $\frac{1}{10}$ of the size of a red blood corpuscle, that is, not exceeding 2 μ in diameter. When the mercury is finely divided, the injections are painless, non-toxic, and readily absorbable. After standing for a long time, some separation of the oil takes place; but, as the oil cannot become rancid, simple shaking will again mix the ingredients and render it safe for use. The dose given was 0·14 gram in men, and 0·05 to 0·07 gram in women. Barthélemy's syringe was employed, by means of which accurate dosage is ensured. Zieler considers grey oil the best remedy for ordinary cases of syphilis; calomel for severe cases. In the latter case he uses the following formula: Calomel 4 or 5 grams, lanolin anhydr. camphor. 5 per cent, and ol. dericini camphora. 5 per cent, in proportions of 1 to 3, to make 10 cc. This yields a mixture which contains 40 per cent by weight of calomel. The calomel must be absolutely pure, and is best prepared by the wet method, washed in pure ether or in boiling alcohol. The manipulations should be carried out in the dark to prevent any chemical dissociation. He injects 0·112 to 0·12 gram of calomel *pro dosi*, and repeats the injections every four to six days. A course includes from eight to fourteen injections.

Leszczynski[48] also objects to the hydrocarbon derivatives (lanolin, paraffin, vaseline, vasenol), as vehicles for insoluble mercurial injections. He is of opinion that the use of these vehicles tends to the accumulation of mercury in the tissues, and therefore to the dangers of mercurial intoxication. For this reason, he uses **Oil of Sesame,** which is more readily absorbed than paraffin. Injections made with this vehicle are said to be usually painless, and free from the danger of mercurial accumulation. Leszczynski recommends the following formulæ: (1) Salicylate of mercury, 1·00; Sterilized oil of sesame, 10·00; 1 cc, every five days; (2) Metallic mercury, 4 grams; palm oil, oil of sesame, āā 20 cc; 0·5 cc. every five or six days.

Lasserre[49] has collected 110 cases of severe accidents, 71 of which were fatal, due to mercurial injections. The majority of these were

certainly due to therapeutic errors—excessive or unknown doses, and neglect of contraindications—but not all. These accidents are more common in the case of insoluble injections. However, Lasserre thinks that insoluble injections have their indications, and does not consider that the accidents sometimes caused by them contraindicate their use.

Volk[50] also considers that the accidents caused by insoluble injections are due to their administration in unsuitable cases, and to errors in dosage, etc., rather than to the method itself. As he points out, accidents occasionally happen with any form of mercurial treatment. He is in favour of **Grey-Oil** injections, given according to the technique of Lang, who was the first to employ them. He uses the 50 per cent grey-oil, containing 0·08 gram of mercury in 1 cc. Injections are performed, according to Lang's method, into the subcutaneous tissue of the back, instead of intramuscularly. This renders injection in two stages unnecessary, and is less liable to puncture veins. The possibility of accumulation of mercury must be borne in mind in the case of insoluble injections; hence the intervals require careful regulation. Volk gives the first six injections at intervals of five to eight days; later on the intervals are increased. A course comprises twelve to sixteen injections. After this they should be suspended for several weeks, to be resumed or replaced by other treatment. The mercury in grey-oil injections is said to be eliminated gradually and regularly, in a similar way to that introduced by inunction. Volk remarks that although mercury is eliminated by other organs than the kidney, and elimination and absorption do not always go hand in hand, clinical and laboratory experience agree to show the curve of renal elimination corresponds to the curve of absorption. Volk objects to soluble injections as a routine method, not only on account of their inconvenience, but because the mercury is eliminated too rapidly to have a continuous action. However, he thinks they are useful when small doses of mercury only are indicated, as in cases of Bright's disease, or when a rapid effect is required, in which case large doses must be given. Of the soluble preparations he prefers the succinimide 2 per cent, or the sublimate 1 per cent.

Volk is in favour of commencing treatment as soon as the diagnosis is settled by microscopic examination of the chancre. He is convinced that by early treatment the secondary symptoms are rendered milder and of shorter duration. He even thinks it possible to destroy the syphilitic virus completely by abortive treatment. In order to effect this result, treatment must be commenced within ten or twelve days after the appearance of the chancre. He states that Lang has had favourable results from the abortive treatment. In two cases the patients became reinfected with syphilis; in one of these repetition of the abortive treatment was successful, but in the other it was commenced too late, and did not prevent generalized syphilis. Volk mentions the successful results obtained by Duhot by his "intensive, immediate, and abortive" method, which is supported by the observations of Jullien, Levy-Bing, Tommasoli, Leredde, and others; but

while declaring himself a partisan of the abortive method, he thinks Duhot's doses too large (14 cgrams of mercury in the form of grey oil). Volk is also in favour of excision of the chancre; although he has not had a successful case himself, he mentions that Scherber, in Finger's clinic, reported a case which was followed for more than two years without any sign of constitutional syphilis being noted. In the interests of the patient, Volk recommends mercurial treatment, together with excision of the chancre. He has tried local treatment of the chancre with atoxyl. He also recommends local injections of grey oil in the neighbourhood of gummata.

Perls[51] has made a statistical study of *tertiary syphilis*, with special reference to previous treatment. He recognizes the difficulty of arriving at any definite conclusion as to the relative merits of the different forms of treatment, because the cure of syphilis is difficult to establish. This question may possibly be decided by serum diagnosis, but in the meantime we must not depend on clinical observation. The first point to decide is whether tertiary syphilis can be prevented by treatment. The presence of the spirochæte in tertiary products and the transmissibility of these to monkeys, prove clearly that tertiary lesions are due to the virus itself. Perls has investigated the cases of tertiary syphilis in Neisser's hospital and private practice, from 1901 to 1907. These cases were divided into four categories: (1) Those who had had no treatment at all; (2) Those who had taken a single course of treatment; (3) Those who had received symptomatic treatment; (4) Those treated by the chronic intermittent method. Among the hospital cases more than half had had no previous treatment (58 per cent in women and 54 per cent in men). Among the private patients the number of women who had had no treatment was still higher (78·8 per cent), while that of the men was much less. The percentages in cases having had one course of treatment were 23·7 for men and 11·7 for women in hospital, and 14·7 and 10·5 respectively in private practice. The percentages in cases treated symptomatically were 21·8 for men and 13 for women in hospital, and 43·8 and 10·5 respectively in private practice. Of all these cases of tertiary syphilis only 0·6 per cent had undergone the chronic intermittent treatment. This seems to show that this form of treatment offers a much greater guarantee against tertiary symptoms than symptomatic treatment. Perls denies that mercury administered during periods of quiescence loses its power when symptoms arise—an objection raised by the partisans of symptomatic treatment. He also remarks that the efficacy of mercury administered during quiescent intervals is sufficiently proved by the success of mercurial treatment during pregnancy. With regard to an astonishing objection raised by Neuhaus, that the chronic intermittent treatment is responsible for tabes and general paralysis, this is sufficiently refuted by the fact that Neisser, out of 542 cases of tabes, found that 50 per cent had not been treated at all, and only 5 per cent had received rational treatment.

Emery and Chatin[52] have recently produced an important work on the treatment of syphilis. They regard **Mercury** as the only true specific drug, and put forward the following arguments in support of its preventive action: (1) When mercury is given as soon as the chancre appears, the secondary symptoms are retarded and attenuated; (2) Tertiary syphilis is incomparably less frequent in patients who have undergone prolonged mercurial treatment than in those who have had no treatment at all, or only symptomatic treatment; (3) Mercury has a preventive action in congenital syphilis. It is therefore necessary in all cases of syphilis, whether mild or severe, as the chief danger is tertiary syphilis, which can never be foreseen from the nature of the early manifestations. The authors recommend intermittent treatment, prolonged for four years and resumed during the seventh and eighth years. The following treatment is recommended for an ordinary case of syphilis: During the first three months daily injections of soluble salts (benzoate or biniodide, 2 cgrams) in series of 20 to 25 injections with intervals of a week; then, after an interval of three or four weeks, if fresh symptoms occur, repetition of the same injections in series of twenty to twenty-five, with intervals of fifteen to twenty-five days; then, in the absence of symptoms, or after their disappearance, treatment by injections of grey oil, in series of six to eight weekly injections of 6 to 10 cgrams of mercury, according to age and weight. Eight months' treatment are given in the first year, six months' in the second year, four months' in the third and fourth years, and four months' in the seventh and eighth years. In using grey-oil injections it is important to have a standard preparation, as some of the accidents caused by grey-oil have been due to errors in dosage. The French official formula is—purified mercury 40 grams, sterilized anhydrous lanolin 26 grams, sterilized oil of vaseline 60 cc. This contains 40 cgrams of mercury in 1 cc. Another important point is a suitable syringe. One of the best is Levy-Bing's, which is intended for the above preparation, and is graduated so that each division represents 1 cgram of the above preparation. Other suitable syringes are Barthélemy's and Edmund Fournier's. The authors give iodide in daily doses of 2 grams, in courses of four to six weeks; 4 courses during the third year, 3 during the fourth year, and 2 during the fifth year. These courses may or may not alternate with mercurial treatment.

Major French[53] compares inunction with injections of grey oil, having had much experience of both methods. He thinks that, although grey-oil injections are convenient in the army, they are not so effective in the early stages of syphilis as inunction or hydrarg. cum creta. He points out that inunction is free from the dangers of grey oil, and that the administration of mercury can be better regulated by this method than in the case of grey-oil injections, where the mercury may accumulate in the tissues and give rise to sudden mercurial poisoning. He mentions many cases of pulmonary embolism occurring after grey-oil injections.

Hay[54] also regards inunction as the ideal method. He points out that accuracy of dosage, which is urged in favour of injections, is no advantage, as the dose requires to be changed for different patients and also in different stages of the disease. He prefers to regulate the mercury by its therapeutic effect.

Freshwater[55] advocates **Iodipin** in the treatment of syphilis. Iodipin is said to be an additive compound of iodine and oil of sesame. It may be administered either by the mouth or by intramuscular injection in the form of a 25 per cent solution. By the mouth it may be given in milk, or as an emulsion with tragacanth, or in capsules. The dose is half to one drachm. For intramuscular injection a syringe of 20 cc. capacity with a large nozzle, a rack and pinion movement, and large-bore needle, is necessary. A course of iodipin injections amounts to 200 or 300 grams, given in doses of 20 grams daily or every other day. Not more than six courses should be given. Iodism is said to be absent, even in cases which cannot tolerate iodide of potassium. Cases which do not take mercury well are said to take it better when given in conjunction with iodipin. The chief advantages of iodipin are said to be as follows: (1) That long courses of iodipin can be given to patients who cannot take iodide of potassium; (2) That "the system can be kept for a period of four to six months under the influence of iodine;" (3) that "the body is under a slow, continuous, regular action of iodine, which is of prophylactic value;" (4) That it has a specific action in tertiary syphilis and arterial degeneration; (5) That "in syphilis of the central nervous system, where iodine is indicated, and the treatment should extend over a long period, this is obtained by the administration of iodipin." On the other hand, iodipin does not replace iodide of potassium when a rapid therapeutic action is required. [We fail to see that the author has made out any case for iodipin. It has not been proved that there is any advantage in keeping the system under the continuous action of iodine for long periods; on the contrary, most authorities agree that iodine should be given for short periods only. It has not been proved that iodine, or iodides, have any prophylactic action in syphilis, nor any destructive action on the spirochæte. As regards syphilis of the nervous system, Sir W. Gowers definitely states that "treatment should be energetic, brief, renewed, but not continuous."]

As the *Spirochæta pallida* is generally regarded as a protozoon, the question naturally arises whether it can be influenced by **Quinine,** in the same way as the protozoon parasite of malaria. In the human subject this question is difficult to decide, as it is hardly justifiable to treat syphilis by quinine alone. However, that quinine has a beneficial action in certain syphilitic conditions, such as cachexia, was pointed out by W. Murray long before the discovery of the spirochæte. More recently, Major French[56] advocates the use of quinine as a temporary substitute for mercury in cases of syphilitic fever, and when there is a history of malaria.

Auto-inoculation and Re-infection in Syphilis.—It used to be stated as a characteristic of primary syphilitic sores that they were not auto-inoculable. This statement has since had to be modified. Queyrat showed that auto-inoculation of the syphilitic chancre gave positive results during the first eleven days following its first appearance. More recently Lambkin, by experimental inoculation in soldiers, found that the chancre was inoculable during the first ten days of its existence. J. Hutchinson[57] has shown, as the result of clinical observation, that chancres may be inoculable for much longer periods than the above. He mentions four cases: (1) A chancre of the lower lip was followed after three weeks by a chancre on the upper lip in a corresponding position; (2) A chancre of the penis was followed in three or four weeks by a chancre of the thumb; (3) A chancre of the glans penis was followed two months later by a chancre at the root of the penis; (4) A chancre of the prepuce was followed in two months by a chancre of the finger. This case is interesting in that the second chancre appeared during the secondary symptoms following the first chancre, and also during mercurial treatment. In all these cases the second chancre was typically indurated and accompanied by the usual glandular enlargement.

Hutchinson also reports seven cases of undoubted re-infection with syphilis, i.e., two distinct attacks of primary and secondary syphilis. The intervals between the two attacks of syphilis were twelve years in one case, eight years in one, seven years in two, three years in two, and only eighteen months in one case. Hutchinson concludes that (1) Efficient treatment by a continuous course of mercury for one or two years is the surest way of rendering a patient susceptible to second infection. With this proviso he may contract syphilis again within two or three years of the onset of the first attack. The treatment of the first attack in all the seven cases was by a steady mercurial course lasting from one to three years. (2) The interval between the attacks of syphilis may be so short as eighteen months, i.e., the patient may no sooner have finished his course of treatment than fresh exposure may produce a complete fresh attack. The average interval is six years. (3) The second attack may be slighter or more severe than the first. If the symptoms on the first occasion have readily yielded to mercury, they will probably do so on the second. (4) There is no reason why the same patient should not go through even three attacks of syphilis, provided the first two have been well treated. Sir J. Hutchinson has recorded one definite example of this and another doubtful one. He also collected fifty-six examples of apparent re-infection, but only eighteen of these conformed with the qualification of the occurrence of both primary and secondary symptoms on both occasions. As Mr. Hutchinson points out, the chief interest in second attacks of syphilis lies in the light they throw on the efficiency of treatment. In practically every one of the twenty-five undoubted cases brought forward by the Hutchinsons, mercury had been administered continuously by the mouth for

periods of one to two years. In several of these cases only a short interval had elapsed before the patient again contracted the disease, and his symptoms were exactly the same as if the virus had attacked virgin soil. Mr. Hutchinson considers these cases an argument in favour of the continuous as opposed to the intermittent treatment of syphilis. They certainly contradict the statements of some Continental syphilologists who say that syphilis can only be cured by injections or inunction.

With regard to the subjects of inherited syphilis acquiring syphilis in later life, Hutchinson thinks the apparent rarity of such cases is explained by the fact that so few adults show conspicuous traces of the inherited disease. It is also probable that severe inherited syphilis with late symptoms appearing about puberty, confers a longer immunity than an ordinary attack of acquired syphilis. He mentions one conclusive case—a man, aged 28, had a penile chancre, double inguinal bubo, and secondary eruption, indicating acquired syphilis; he had also undoubted signs of the inherited disease, as shown by sunken nose, chronic ozæna, symmetrical deafness, and old interstitial keratitis.

In the case of experimental syphilis in apes, Neisser has shown that this can be cured by mercurial treatment, so that the animals can be successfully re-inoculated with syphilis.

Experimental Syphilis.—Levy-Bing and Laffont[58] give a summary of the recent results of experimental syphilis in animals, and their bearing on human syphilis. Inoculation of apes from human chancres shows that recent chancres give positive results more often than those in process of cure. Inoculations from secondary papules and mucous patches are generally positive. Inoculations from tertiary gummata are positive when the material is taken from the peripheral part of the gumma, but negative when taken from the central necrotic part. According to Neisser, the contagiousness of the gumma is limited to the initial period of evolution of the tertiary manifestations, and ceases with the stage of gummatous degeneration of the tissues, or the period of involution. Hence, inoculations must be made from gummas which have not undergone necrosis and are still covered with healthy skin. This is in accordance with the results of microscopic examination, spirochætes having been found in the peripheral parts of gummas by Schaudinn and others. Positive inoculations have been made from juice obtained by puncturing the lymphatic glands, both in the case of the primary adenopathy and in general adenitis. As regards the blood, it has long been known that at certain periods of syphilis the blood is contagious, but not at others. This fact has been verified by the experiments of Hoffmann, Finger, and Landsteiner, who inoculated apes with blood from untreated patients with secondary syphilis. Hoffmann obtained a positive result three times, and a negative result twice. Finger and Landsteiner obtained a positive result in one case, and Neisser obtained a chancre in an ape by inoculating with blood from the heart of a heredo-syphilitic. The rarity of the

spirochæte in the blood, and its disappearance during mercurial treatment, explain the negative results of some observers. Hoffmann has shown that the blood of syphilitics may be infectious forty days after inoculation, before the appearance of the roseola, and that it may retain its virulence six months after the commencement of the disease. In the case of two apes inoculated by Neisser, the blood was found to be virulent fourteen and eighteen days respectively after inoculation, showing that general infection was already present before the chancre appeared at the point of inoculation. Recent research tends to confirm the view (which was held by the older syphilologists such as Diday) that the semen is contagious. Finger and Landsteiner successfully inoculated two apes with semen from a man with secondary syphilis dating four months. The semen was obtained by expression of the seminal vesicles in a subject free from urethral lesions. In another case a positive result was obtained by inoculation of an ape with semen from a patient whose syphilis dated three years. These observers conclude that the semen of syphilitics is always virulent in the secondary period, even when the testicles are apparently healthy, but that in tertiary syphilis it is only virulent when the testicles are the seat of specific lesions. These results agree with those obtained by Neisser in apes.

Hoffmann successfully inoculated an ape with cerebrospinal fluid from a patient with secondary syphilis. This result is in accord with recent microscopic observations. Neisser found the spirochæte in the cerebrospinal of a patient with secondary syphilis. Babes and Pinca also found it in the case of still-born syphilitic infants. More recently Gaucher and Merle report a case in which the spirochæte was found in the cerebrospinal fluid of a patient who died of cerebrospinal syphilis. In this case dark-ground illumination was employed. Inoculation with milk, saliva, sweat, and urine have so far given negative results. Neisser obtained a positive result from inoculation with nasal mucopus from a syphilitic infant, and also positive results from inoculation of the various viscera of congenital syphilitics (lung, liver, kidney, suprarenal capsule, and testicle).

Syphilis in the Rabbit.—Cases of keratitis have been produced in the rabbit by intra-ocular inoculation of syphilitic virus by Bertarelli and others. The production of general syphilis has lately been reported by Grouven,[59] who describes the clinical and post-mortem appearances which he made on a rabbit presenting signs of generalized syphilis. The animal was inoculated on Dec. 1, 1906, in both eyes, with human syphilitic material. In four weeks keratitis developed in the left eye. The first symptoms of general syphilis appeared in July, 1907 (loss of hair, emaciation, infiltrations, and rhagades containing spirochætes). At the end of October keratitis appeared in the right eye, probably of hæmatogenous origin. An undoubted symptom of general syphilis appeared in February, in the form of an ulcerated papule on the prepuce, containing numerous spirochætes. This was followed by a similar papule near the anus, erosions about the nares,

in the secretion of which spirochætes were numerous, and a papulo-pustular eruption on the back, ulcerated in places, serpiginous, and covered with rupial scabs. In April, 1908, fresh papules appeared on the prepuce and anus. The animal died soon after with signs of consumption. At the autopsy, there was hepatization of the middle lobe of the right lung, together with white nodular infiltrations; the right testicle and epididymis were enlarged, and presented disseminated nodules on the surface and necrotic points on section; the other viscera appeared normal. Microscopic examination of sections showed the presence of numerous spirochætes in the testicle and epididymis, in a caseous gland, in the nasal mucous membrane, the right cornea and conjunctiva, and in the papules on the prepuce and anus. Less numerous spirochætes were found in the sclerotic, iris, ciliary body, choroid, and retina of the right eye. The kidney contained a few spirochætes, the suprarenal capsule and spleen none, while the lung and liver were doubtful. A second rabbit inoculated on the eyelid with material obtained from the first, developed a typical infiltrated lesion at the point of inoculation. Six months after inoculation spirochætes were found in sections of this lesion. Up to the present, a year after inoculation, no symptoms of general syphilis have appeared, although the serum diagnosis was positive.

Experimental syphilis in rabbits has been transmitted with positive results to apes by Brunning from corneal lesions, and by Siegel from the viscera; to the cat by Levaditi and Yamanouchi, and to the guinea-pig by Bertarelli.

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SYPHILIS, CONGENITAL. *C. F. Marshall, M.Sc., M.D., F.R.C.S.*

Comby[1] recommends **Mercurial Inunction** in congenital syphilis, and advises treatment for three years. The inunction is performed for five minutes daily with 2 grams of mercurial ointment, applied (by flannel) to the right and left sides of the abdomen, the right and left axillæ, groins, and thighs in succession. During the first year the rubbings are performed daily, with an interval of fifteen days every three months. During the second year the rubbings are performed every alternate month, and in the third year one month out of three. In the early months of congenital syphilis, Comby recommends the application of 10 per cent calomel ointment to the nostrils. When skin eruptions are present, he uses sal-alembroth baths (30 cgrams of perchloride of mercury and of ammonium chloride in 3 litres of water).

REFERENCE.—[1]*Lancet*, Mar. 27, 1909.

Prof. G. F. Still, M.D., F.R.C.P.

The most important symptom during the first few days of life, according to Kerr,[1] is a persistent rhinitis. This occurs usually during the first four weeks of life, and may be very prolonged. Discharge is generally profuse, and sometimes blood-tinged. If ulceration occurs, there may be destruction of cartilage and consequent deformity. The mucous membranes of the lips and anus are sometimes fissured, and Kerr considers these fissures, or the occurrence of mucous patches, to be very strong evidence of syphilis. In his experience, when the local symptoms of the disease are well developed, the constitutional ones are less so; on the other hand, when the local symptoms are slight, the constitutional are severe. The nails of the syphilitic infant are often involved, showing suppuration in the matrix and consequent nail destruction; but, before this, there may be simple arching of the dorsum of the nail, and this has considerable diagnostic import. Amongst the bone affections of congenital syphilis, Kerr mentions the epiphysitis, which occurs most often in the upper limb, but sometimes in the lower; and he states that when the upper limb is affected there is flaccidity, whereas when the lower is affected there is spasticity, a difference depending on the anatomical relations of the musculature to the joints.

Wallis[2] draws attention to the occurrence of "notching" in the lower incisors; it is generally stated that the notching described by Hutchinson affects the upper incisors, whilst the lower are supposed to be unaffected; it is probably quite common for the lower ones to show this change, but in a much less degree than the upper incisors. *See also* CORNEA ("Interstitial Keratitis").

Fairbanks[3] describes some of the cerebral affections which are due to congenital syphilis. Meningitis, arteritis, and gummata may occur. He mentions certain general characteristics of such affections: they are multiform, subacute, erratic in their course, and often produce as their earliest symptoms, headache, with alteration in disposition and intellect. The most unfavourable cases are those in which there

is arteritis. Ravant and Darre[4] describe the case of a girl aged three months, who had marked evidence of syphilis at three weeks, and developed convulsions with opisthotonos and Kernig's sign when three months old. During six months, lumbar puncture was done on ten occasions, and it was observed that the number of lymphocytes in the fluid withdrawn decreased progressively. In the next three years lumbar puncture was done on five occasions, in spite apparently of the child making normal progress, and on each of these occasions the spinal fluid was normal.

The reaction known as Wassermann's (*see* preceding paper), has now been used by various observers in congenital syphilis, and has been thought valuable when it yields a positive result, but it is agreed that a negative result does not prove the absence of syphilis: Kerr even states that "a negative reaction means nothing." An interesting study is that published by Knoepfelmacher and Lehudorff.[5] These observers applied this test to fourteen mothers of children with hereditary syphilis; the mothers themselves had shown no evidence of syphilis, nevertheless every one of the fourteen yielded a positive reaction. The authors regard this as proof, so far as it goes, that the women had had syphilis. It is, however, difficult to accept this conclusion, for the reaction merely proves that the antibody was present in the blood, and it is quite conceivable, as was suggested years ago, that some such protective body might be elaborated in the fœtus and pass to the mother without any syphilis occurring in her.

The diagnostic significance of palpability of the epitrochlear glands in infants is considered by Reiche,[5] who comes to the conclusion that palpable epitrochlear glands are frequently found in syphilitic infants, but may also be present in other conditions, for instance, where there are local inflammatory processes; these glands, he says, drain the superficial structures of the hand and forearm, not the bones and deeper structures. Palpability of these glands, although not pathognomonic of syphilis, is valuable confirmatory evidence where the presence of syphilis is suspected.

TREATMENT.—Vaillant[6] insists on the importance of **Breast-feeding** the syphilitic infant wherever possible; he points out how liable these infants are to marasmus and to gastro-enteritis. If breast-milk cannot be obtained, he recommends **Asses' Milk,** and failing this, sterilized cow's milk.

Van Wart[7] records the treatment of an infant aged eight weeks by **Intramuscular Injections of Mercury.** A solution of salicylate of mercury in olive oil (5 gr. to 1 oz.) was used; $\frac{1}{5}$ gr of the salicylate was injected into the buttock every two days. In this case the child had had snuffles; but apparently the only symptom which occasioned the infliction of this painful method of treatment was a papular rash on the skin, which had not yielded quickly to the ordinary oral and inunction treatment of congenital syphilis. It is difficult to believe that there is any occasion whatever to resort to such a painful mode of administering mercury, except possibly in some nervous and eye-

affections—for instance, iritis due to congenital syphilis; and even in these it may be doubted whether the child can be brought under the influence of the drug more rapidly or completely than is possible by free administration of mercury as **Grey Powder** by mouth, and by inunctions of **Unguentum Hydrargyri** or of the **Oleate of Mercury.**

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TABES. *Purves Stewart, M.D., F.R.C.P.*

Whilst nearly all modern neurologists are agreed that syphilis is a necessary antecedent of tabes dorsalis and general paralysis of the insane, the exciting factor which determines why some syphilitics should become tabetic whilst others escape is still undetermined. Ford Robertson[1] maintains the specificity of a diphtheroid organism, his so-called *Bacillus poralyticans longus*. As a predisposing factor he considers that gonorrhœa is of greater importance than syphilis, but he adduces no evidence in support of his assertion. He thinks that tabes is induced by a secondary infection by this diphtheroid organism *via* the genito-urinary tract, whilst general paralysis is put down to an invasion by the same organism *via* the nasopharynx and mouth. He has therefore treated tabes and general paralysis by means of an antibacterial serum prepared in the sheep by immunization with these special diphtheroid bacilli, and claims to have produced distinct arrest in the symptoms of these diseases. No details of his cases are furnished. He admits that secondary bacterial infections (apart from that of his diphtheroid organism) are very prone to occur in tabetic and general paralytic patients; thus, for example, pyorrhœa alveolaris is common in well-established cases, and multiple bacterial invasions occur throughout the mucosæ of the respiratory and alimentary tracts as terminal phenomena in general paralysis (and also, though he does not emphasize this, in the terminal stages of many other forms of insanity). Most neurologists, however, regard these observations as inconclusive as to any specificity of Robertson's bacillus, and consider its presence as a secondary infection like the others. Many cases of tabes and general paralysis have been found free from any organism whatever in the cerebrospinal fluid, which is supposed to be the most constant habitat of the bacillus. Moreover, the occurrence of cases of puerile and adolescent tabes and general paralysis in patients who have never been exposed to genito-urinary infection, and in whom there has been no special infection of the mouth or pharynx, constitutes a strong point against the acceptance of Robertson's hypothesis. I can recall at least one case of general paralysis under my own observation, in which the patient was submitted to a prolonged course of the serum treatment by Robertson himself. Temporary remission followed, but the fatal result occurred as anticipated within two years.

More recently Denslow[2] has suggested that tabes is attributable to a reflex irritation from continuous stimuli resulting from the presence of lesions in the urethra or elsewhere in the mucosa of the genital tract. According to him, the most frequent lesion is "an erosion which has probably existed for years." He claims to have treated with benefit some ten cases of tabes by local applications through the urethroscope during a period of three or four months, and states that not only was the bladder trouble relieved, but the ataxia of the legs was remarkably benefited. His results, however, require closer scrutiny before they can be accepted as accurate, and in this connection it is interesting to note that McLane Hamilton[3] has never seen a case of tabes in which there were any urethral lesions. Hamilton also quotes Pedersen, a genito-urinary surgeon of great experience, who writes: "I do not recollect having treated (by urethroscopic applications), with benefit to the general condition, any true case of locomotor ataxia." Moreover, here again the occurrence of congenital tabes in children and adolescents of both sexes, in whom there has been no urethral infection, is strongly against such a theory.

In the absence of a complete knowledge as to the etiology of tabes our treatment must of necessity be mainly symptomatic. Prevention can be best insured by the avoidance of syphilitic infection. Once the disease is established we have to deal with its various symptoms as they arise. Avoidance of fatigue, physical or mental, is essential in every case of tabes. Not only is the sensation of muscular fatigue frequently diminished in tabetic patients, so that they continue with physical exercise when they ought normally to feel tired, but as a matter of clinical experience it is found that fatigue aggravates ataxia. Many tabetics, when recognized as such during the pre-ataxic stage of the malady, if they attend to this maxim need never become ataxic at all. I myself have watched many tabetic patients for periods of over ten years without any ataxia developing in their cases.

Once ataxia has appeared, if it has supervened acutely, it is advisable to make the patient rest in the horizontal posture for several weeks at least, rather than allow him to struggle on with progressively increasing difficulty, adding to his fatigue by loading his ataxic limbs with the weight of his body. When the ataxia is no longer advancing in intensity, systematic **Exercises on Frenkel's System** may be employed, beginning with simple movements in the recumbent and sitting positions, then, later on, practising movements in the erect attitude. Great patience and perseverance are required in order to obtain satisfactory results. If the patient has not too marked a degree of muscular hypotonia, his ataxic limbs can often be re-educated to a remarkable degree, and he may regain the power of walking which he had previously lost.

Cystitis and ascending pyelonephritis constitute the most serious complications of tabes. In most cases, however, cystitis can be prevented, inasmuch as it is probably the result of dilatation of an

anæsthetic bladder where the patient does not appreciate the sensation of fullness. The residual urine readily becomes infected, and cystitis with all its sequelæ is the result. Fortunately, cystitis can usually be prevented by instructing the tabetic patient to micturate every three or four hours during the daytime, whether he feels the bladder distended or not; also to get up during the night and empty his bladder. In this way the bladder never becomes over-full, and there is no residual urine to undergo decomposition. If the bladder is already dilated, the residual urine must be drawn off regularly by a catheter, with every antiseptic precaution; and if cystitis be present, the bladder must be regularly washed out with a suitable antiseptic solution.

The pains and crises of tabes can generally be controlled by means of **Morphia,** but this should not be administered in routine fashion. It is advisable to try other remedies first, before allowing the patient to become a morphia habitué. Many of the coal-tar products have been employed with encouraging results, and they should be given in full doses; thus we may employ **Phenazonum** (gr. 20), **Phenacetin** (gr. 20), **Exalgin** (gr. 3), **Pyramidon** (gr. 10), or **Salicyl-acetic Acid** (gr. 20). In cases where there is a high blood-pressure a course of **Nitroglycerin** (gr. $\frac{1}{100}$ or more three times a day) is sometimes of value. Weber[4] tried the effect of hypodermic injections of **Thiosinamine** (min. 30) in three cases of tabes with lightning pains. In two of these no benefit resulted; in the third the pains, which were of five years' duration, disappeared after the sixth injection.

Tabetic Gastric Crises.—Tabetic crises constitute one of the most obstinate and distressing phenomena of the disease. By a crisis, we understand an irritative paroxysm connected with some particular organ. Thus, in the gastro-intestinal tract we may have pharyngeal, œsophageal, gastric, intestinal, and rectal crises; in the respiratory tract, crises may be nasal, laryngeal, or bronchial; in the genito-urinary tract, they may be renal, vesical, urethral, uterine, etc.; we may also have cardiac, ocular, auditory, and even gustatory crises, whilst lightning pains may be regarded as crises in the limbs. All these crises, of whatever variety, have certain characteristics in common. Firstly, they have irritative sensory phenomena in the region of the affected organ, either in the form of pain or of some specific organic sensation, e.g., pain and nausea in gastric crises, pain and tenesmus in intestinal crises, pain and tickling cough in laryngeal crises, pain and inclination to micturate in vesical crises, pain and photophobia in ocular crises, shooting pains in crises of the limbs. Secondly, there are irritative motor phenomena in the sphere of the affected organ, consisting in motor reactions to the intense painful stimulus, e.g., vomiting in gastric crises, imperative diarrhœa in intestinal crises (generally producing only a small mucous stool), imperative micturition of small quantities of urine in vesical crises, stridor and cough in laryngeal crises, blepharospasm in ocular crises, twitchings of the affected limbs in crises of the extremities. Thirdly, there are

irritative secretory phenomena in the sphere of the corresponding organ, e.g., gastrosuccorrhœa in gastric crises, excessive mucous secretion in intestinal crises, laryngeal catarrh in laryngeal crises, lacrymation in ocular crises, sometimes œdematous swelling of the limb in crises of the extremities. Further consideration shows that these three kinds of phenomena, sensory, motor, and secretory, common to all crises, are not on the same genetic level, but that the primary phenomenon is sensory, whilst the motor and secretory phenomena are secondary and reflex.

Förster and Küttner[5] have studied the subject of gastric crises in some detail. They point out that the primary phenomenon in a gastric crisis is paroxysmal pain in the region of the stomach, which may spread over the whole belly. The pain is usually most severe in the epigastrium and at the left costal margin, but it may spread to both costal margins, and even to the lower angles of the scapulæ. In addition, the patients often complain of an intense raw feeling in the lower thorax and upper abdomen—sometimes extending over the whole abdomen. The skin of the abdomen in many cases is exquisitely hyperæsthetic, and the lightest touches produce violent pain. This cutaneous hyperæsthesia is most marked in the epigastrium and along the costal margins, and may extend upwards on to the thorax and downwards as far as the umbilicus. Together with this, the epigastric reflex sometimes becomes markedly increased, so that the lightest touch may elicit a reflex, and from a widely increased area of skin, whilst the abdominal muscles may be thrown into a state of tonic spasm. It is also noteworthy that this cutaneous hyperæsthesia and exaggeration of the abdominal reflex during a gastric crisis may be observed in cases where the same patient, during the intervals between the crises, has diminished cutaneous sensibility. The motor phenomena in gastric crises consist in repeated vomiting and frequent hiccough ; sometimes the whole abdominal wall is in a state of tonic spasm throughout the crisis. The gastric mucosa secretes a large amount of mucus and gastric juice, which is vomited, sometimes in very large amount. The secretion of bile, of saliva, and even of bronchial mucus, may also be increased during the gastric crisis, and there may be elevation of temperature throughout its course.

An evidence that the sensory phenomena are the primary ones in tabetic cases is the fact that pains generally precede the paroxysms of vomiting, and that they persist in the intervals between these paroxysms. There is often a continuous, well-marked circumscribed girdle-pain, which becomes aggravated with each paroxysm of vomiting. Moreover, nausea is often present for a long time before vomiting occurs, and may persist as a continuous phenomenon, so that in his endeavour to alleviate his nausea the patient may repeatedly try to induce vomiting artificially with his finger. A further evidence of the primary importance of sensory irritation is the hyperæsthesia of the gastric mucosa, appearing long before the onset of the vomiting, and lasting for some time after it has ceased. It is thus often the

earliest herald and the last lingering sign of the crisis. Before actual spontaneous pains occur, pain and even vomiting may be induced with abnormal readiness by ordinary foods which are perhaps colder than normal and slightly less digestible. This abnormal sensitiveness of some tabetics to certain articles of diet may be continuous for months or years; in other patients it passes off completely in the intervals between the crises. Finally, we have the fact that cutaneous hyperæsthesia of the abdominal wall, with increase of the abdominal reflex, is often present before the onset of the vomiting, lasts throughout the attack, and may continue for some time after the crisis is over.

The sensory nerves from the stomach are the vagi, also the sympathetic fibres leading from the stomach to the cœliac plexus and thence by the great splanchnic nerves and the rami communicantes to the posterior roots in the thoracic region of the cord, especially the 7th, 8th, and 9th thoracic roots. The cutaneous hyperæsthesia of the abdomen also corresponds in the main to these roots. Accordingly Förster and Küttner decided to divide these posterior roots, in the hope of relieving those tabetic gastric crises. The cutaneous hyperæsthesia of the abdomen seemed to point to these roots rather than to the vagi as the proper nerves to attack, though they admit that cases with marked vagal symptoms, e.g., laryngeal and cardiac crises (bradycardia and pulsus alternans), might be unsuitable for operation.

Hitherto the treatment of gastric crises has been most disappointing. In many patients these crises dominate the whole clinical picture, and not merely render life unendurable, but actually imperil it. Such patients inevitably become addicted to morphia, whereby their cachexia is increased and the fatal end is often hastened.

Förster and Küttner's patient was a man of 47, an architect, who had a syphilitic history, but had been energetically treated with mercury. Six years ago his illness began with violent attacks of vomiting. The crises gradually increased in duration, and he vomited as much as 1½ litres of mucus, bile, and gastric juice per diem. Latterly, in spite of morphia hypodermically, amounting to 7 gr. daily, he never went more than five or six days without an attack, and the actual paroxysms lasted for about three weeks at a time. The pupils were small and of Argyll-Robertson type. He had frequent lightning pains in the legs and arms, and around the costal margins, also delay and precipitancy of micturition. There was paræsthesia in the hands and feet, and marked cutaneous hyperæsthesia over the lower part of the thorax and the whole of the abdomen. The abdominal reflex was exaggerated and could be elicited by touches, not merely on the abdomen, but even on the thighs. The abdomen was somewhat distended; but there was constipation, with great spasm of the anal sphincters. In view of occasional colicky pains which occurred over the abdomen, the authors decided to divide the 10th thoracic roots in addition to the 7th, 8th, and 9th.

The operation was performed in two stages. At the first stage the spinal theca was exposed between the 5th and 10th thoracic spines;

immediately after this stage there was an intense exacerbation of the vomiting, which persisted in spite of large doses of morphia, saline infusions, and nutrient enemata. Accordingly, eleven days later, the second stage was undertaken and a portion was excised from each posterior root from the 7th to the 10th on both sides. The result was immediate and remarkable: pain, nausea, and vomiting ceased at once, and the patient developed a brisk appetite, which increased from day to day. There was meteorism for the first day, but this gradually disappeared. The morphia was rapidly diminished, but the patient developed signs of morphia-abstinence, such as sweating, salivation, and collapse, so that when he had been reduced to 8 mgrams daily, the amount had again to be somewhat increased. Four months after the operation the patient had gained weight and was in good physical condition, gaining about 4 lb. a week. The gastric crises had completely ceased since the operation. There still persisted a zone of total cutaneous anæsthesia in the distribution of the excised roots, viz., from three fingers'-breadth below the ensiform cartilage to one finger's-breadth above the umbilicus; above and below this there was a narrow zone of diminished cutaneous sensibility, in which touch was still felt, but not pain or temperature. The epigastric reflex could not be elicited from the anæsthetic area, although it could still be obtained by stimulation above and below—but no longer from the thighs. A few colicky pains still occurred in the abdomen, varying in intensity. The other tabetic symptoms, lightning pains, bladder-troubles, etc., were as before.

References.—[1]*Lancet*, Nov. 14, 1908; [2]*Med. Rec.* Nov. 21, 1908; [3]*Jour. Amer. Med. Assoc.* Dec. 5, 1908; [4]*Med. Rec.* Nov. 28, 1908; [5]*Beitr. z. klin. Chir.* June, 1909, p. 245.

TELANGIECTASES, MULTIPLE HEREDITARY.

E. Graham Little, M.D., F.R.C.P.

Hanes[1] records eight new cases of this very rare affection, occurring in two unrelated families. In the first, recurring hæmorrhages were found in four generations of one family, with multiple telangiectases of skin and mucous membrane, and without hæmophilia. A woman, whose mother and two brothers suffered from telangiectases and severe epistaxis, is the first case recorded; she had suffered for forty years from severe epistaxis, and latterly developed the telangiectases. Three of the children and one grandchild had the same symptoms, the latter, a child of 8, being the youngest victim of the disease yet recorded. In the second series of cases, four sisters were affected, the symptoms being very similar, comprising severe epistaxis and telangiectasis of skin and mucous membrane. Coagulation-time was much retarded in all the cases examined. An exhaustive summary of the literature of this disease is appended. Treatment in one case seemed successful; the visible telangiectases were destroyed with **Chromic Acid,** and the patient's general condition was improved by **Fresh Air, Arsenic,** and **Iron**

Reference.—[1]*Johns Hop. Hosp. Bull.* Mar. 1909.

TESTES, TUMOURS OF. *Priestley Leech, M.D., F.R.C.S.*

Rowlands and Nicholson[1] report what is apparently a unique case of primary squamous-celled epithelioma of the epididymis. The patient was 46 years of age. On Christmas Eve, 1906, the affected testicle was grasped and squeezed rather severely, but no swelling resulted. On March 12th, 1907, he consulted a surgeon for what was apparently chronic orchitis; no history of gonorrhœa or syphilis; it did not yield to treatment, and it was removed with the diagnosis of tuberculous testicle. Microscopically the tumour consisted of a fibrous stroma surrounding large columns of cells resembling an ordinary squamous-celled carcinoma; there were also cell nests and prickle cells. (1) It may have been a secondary deposit of an epithelioma in some other situation; none such could be found; (2) The epithelioma may have grown in an inclusion dermoid in the neighbourhood of the epididymis; there was no evidence of this; (3) It may have originated primarily in the epithelium of the epididymis; the author thinks this was the real origin. The epithelium of the epididymis is columnar, and that the tumour was a squamous epithelioma may be explained either by metaplasia or from some displaced cells from the epiblast which lies immediately over the Wolffian duct in the embryo from which the epididymis is developed.

REFERENCE.—[1]*Lancet*, Jan. 30, 1909.

TETANUS. *Purves Stewart, M.D., F.R.C.P.*

In former volumes of the *Medical Annual* (1904, 1905, 1907, 1909) we have directed attention to the encouraging results obtained by Baccelli and other Italian physicians in the treatment of tetanus by means of subcutaneous injections of a 3 or 4 per cent solution of **Carbolic Acid.** This method of treatment has been mainly tried in Italy, and an additional number of recent successful cases have been published, notably one by Piccagnoni,[1] who also mentions two other serious cases successfully treated by other observers. Piccagnoni's case was in a medical man, 30 years of age, who had a compound fracture of the leg resulting from a tramway accident and necessitating amputation. The wound sloughed, and marked septicæmic symptoms supervened. On the eighth day after the accident, tetanic spasms appeared in the limbs and also in the jaw. For two days intravenous injections of Tizzoni's antitetanus serum were given, but without alleviation of the tetanic symptoms. Accordingly, on the fourteenth day, hypodermic injections of carbolic acid were begun, in 3 to 4 per cent solution, the total daily amount of pure phenol thus injected varying from 72 cgrams to 1·84 grams in the twenty-four hours, an injection being given every hour or so during the daytime. Chloral and bromide were also administered per rectum in full doses. After nine days of this treatment, gradual improvement set in: the tetanic spasms diminished in frequency and severity, the trismus gradually relaxed. The daily amount of phenol was gradually diminished to 40, 30, and ultimately, on the twenty-first day, to 24 cgrams per diem.

On the twenty-third day a slight relapse was treated by 12 cgrams in two injections. A subsequent operation was performed on the injured limb, removing the infected area afresh, and the patient made a complete recovery from all his tetanic symptoms.

Piccagnoni directs attention to the increase of arterial tension which accompanies tetanus, the height of the arterial pressure being parallel to the intensity of the tetanic symptoms. He attributes the arterial hypertension to vasomotor spasm, and attributes the scanty urine to the same cause. The urine is concentrated and may have a sp. gr. of as much as 1037 ; but there is no albuminuria. To combat this, he favoured diuresis by means of large saline enemata. The course of this case demonstrated the extraordinary tolerance of tetanus patients to the administration of phenol. No signs of carbolic acid poisoning supervened throughout the course of the disease.

Another method of treatment which has found a number of supporters, chiefly in America, is that suggested by Meltzer,[2] who in 1905 found that **Magnesium Sulphate** injected intraspinally produced spinal anæsthesia, and who therefore in 1906 suggested its employment in cases of tetanus. McPhedran,[3] of Toronto, records a case thus treated. The patient, a boy of 13, cut his foot in a farmyard. A week later, tetanic spasms supervened, and in spite of treatment with bromide and morphine, he remained severely ill for nine days. He then had two injections of antitetanus serum without benefit. Accordingly, two days later, 2 cc. of sterilized 25 per cent solution of magnesium sulphate were injected into the spinal canal in the 3rd lumbar interlaminal space. This produced freedom from spasms for ten hours. Next day, 3 cc. were injected, after which the spasms entirely ceased, and in a month the patient was discharged cured. After each injection there was muscular relaxation, but neither sensory nor motor paralysis. The case was not one of great severity, but McPhedran claims that the magnesium sulphate had a beneficial effect. The dose suggested is 1 cc. for each 25 lb. of body weight. He states that eleven cases have been treated by this method, with six recoveries (or 54 per cent). Some of these were mild cases, which might have recovered spontaneously, but one at least was a severe one, reported by Miller,[4] who gave eleven injections in fourteen days, and obtained a cure. In four of the cases pulmonary œdema supervened, and may have contributed to the fatal result.

References.—[1]*Il Policl.* (Sez. Practica), April 11, 1909 ; [2]*Jour. Exper. Med.* 1906, p. 708 ; [3]*Canad. Jour. Med. and Surg.* June, 1909 ; [4]*Amer. Jour. Med. Sci.* 1908, p. 781.

TETANUS, POST-OPERATIVE. *Priestley Leech, M.D., F.R.C.S.*

Richardson[1] has collected notes of 21 cases in which tetanus has followed a surgical operation ; 20 occurred during the past 3½ years, and 1 as long ago as 1884. He has had 2 cases in his own practice : one in 1907 after a cholecystotomy, another in 1909 after an operation for strangulation of the omentum in the sac of a right inguinal hernia. In both cases he blamed the catgut, but bacteriological examination

of the catgut showed it to be absolutely sterile. Many surgeons firmly believe that the catgut is the infecting agent. In 14 of the 21 cases the catgut was submitted to bacteriological examination, and in 4 a bacillus resembling the tetanus bacillus was cultivated from the catgut, but no animal has been infected with tetanus by means of the cultures in those cases in which the experiment was tried. In one case the catgut was found to be sterile, but cultures of a bacillus were obtained from the pedicle of an ovarian cyst for which the patient had been operated upon and which was removed after death, though it was not found possible to cause tetanus in animals by inoculation with the cultures. Richardson then refers to a paper by the late Prof. D. J. Hamilton on the alimentary canal as a source of contagion; in it Hamilton dealt with a group of diseases prevalent among sheep of a nature closely resembling tetanus. The object of the paper was to call attention to the relationship existing between these diseases of the sheep and many obscure diseases in man; the former are caused by specific bacilli whose habitat is the lumen of the intestine, but which at certain periods of the year pass through the wall of the bowel and are found in the peritoneal liquid, but in no other part of the body. The result of their activity is the liberation of toxins which, when absorbed, produce in the sheep symptoms of a tetanic nature. The disease called "louping ill" or "trembling" was used by Hamilton as the type of the group.

The points in this paper which bear upon the subject of post-operative tetanus are: (1) The similarity of these diseases in the sheep to tetanus is most striking and is not only seen in the character of the bacillus but also in the symptoms. (2) The bacillus seems to enter through the alimentary canal, and in sheep there is no evidence of any disease except the turbid peritoneal fluid, which contains a large, coarse-looking rod organism having a great tendency to spore. (3) All these diseases tend to recur periodically and disappear; all of them tend to vanish in the summer. (4) Geographical distribution: they prevail only in certain districts, and mainly along the west coast and southern counties of Scotland and the northern counties of England, while the east coast of the whole of Great Britain may be said to be almost exempt from their ravages. The valley of the North Tyne is one of the most severely smitten areas.

Is the disease true tetanus, and is the infection conveyed by the catgut? The catgut usually supplied to the large hospitals in England, Scotland, and Ireland is procured from Germany. If it is the vehicle of infection, tetanus should occasionally follow surgical operations in all parts of the United Kingdom, because catgut is very largely used by surgeons all over Great Britain, and yet post-operative tetanus is unknown in the south of England. Of the 21 cases, 11 occurred in Northumberland, 6 in Ireland, 2 in Scotland, 1 in South Shields, and 1 in Manchester. That is, they were found in the same geographical area as that in which the tetanic group of diseases in the sheep is prevalent. In the 21 cases recorded, 19 followed operations in which

the peritoneal cavity was opened, and as there are as a rule in a hospital twice as many operations in which the peritoneal cavity is not opened as there are in which it is opened, it is curious there should be so many recorded in the smaller class. It would not be surprising to find that the bacilli so common in sheep are frequent in the human intestine, or that the patient himself is the host of the bacilli at the time of operation. Richardson concludes his very interesting paper by suggesting: (1) That the disease which we call post-operative tetanus is not tetanus at all, but one of the sheep diseases; (2) That it is not introduced by the catgut; (3) That the patient is, at the time of the operation, the host of the bacillus; (4) That we must look upon these cases of post-operative tetanus as cases of idiopathic tetanus, accepting Hamilton's suggestion that idiopathic tetanus is not true tetanus. The disturbance aroused by opening the abdomen may favour the activity of bacilli which possibly would have remained dormant otherwise,

REFERENCE.—[1]*Brit. Med. Jour.* Apr. 17, 1909.

THORAX, SURGERY OF. (*See also* EMPYEMA; HEART, SURGERY OF; TUBERCULOSIS, SURGICAL, etc.).

Rutherford Morison, F.R.C.S.

Surgery of the thorax is advancing, and recent additions are the result of animal experimentation. The law in England being inimical to this essential, British surgeons have to wait and learn from those not hampered by the same restrictions. Apart from ordinary surgical difficulties, the thorax offers three special problems for solution. The first concerns diagnosis. It is impossible or difficult, on account of the rigid walls and the inaccessibility of its contents, to make use of the two most important aids to diagnosis, inspection and palpation. Consequently the detailed diagnosis necessary for successful surgical procedures is not infrequently unavailable. The second difficulty arises from the fact that an opening made through the chest wall, unless adhesions prevent it, is followed by collapse of the lung and pneumothorax. The third refers to the healing of the wound, which may be made exceptionally difficult from the rigid chest walls.

The first difficulty, that of diagnosis, can be surmounted by the possibility of complete examination, and this could only be accomplished after an opening had been made in the thorax sufficiently large to allow of inspection and palpation of its contents. The danger attending exploratory incision has up to the present time prevented this advance. But this danger is passing away, because experiments have proved that by means of apparatus it is possible to prevent collapse of the lung when the thorax is opened. This has been accomplished by two methods: the first for securing negative pressure, of which the Sauerbruch negative pressure-chamber is the type, and the second for producing positive pressure by administering compressed air through a special mask. For the third difficulty, till some plan of filling up the cavity with sponge-graft, or other substance unlikely to cause disturbance in the pleura, has been evolved, it will be needful

to continue the rough means that have been long in use for the cure of chronic empyemata.

For difficult and prolonged operations in the thorax, the use of these methods is essential to success, but I have proved that exploration and the more simple operations, such as excision of the lung, can be done without them. More than once I have opened the thorax so freely as to allow of complete inspection and palpation of the lung, and the patients have recovered without undue trouble. The case recorded later, in which I excised the lower half of the lung, proves that this also may be done with success, for though this patient died, her death from septic pericarditis was the result of septic infection previous to the operation. My belief, on which I have acted, is that pneumothorax, if produced slowly, is not the grave danger that it has been supposed to be. The means of accomplishing this are given later in the relation of my case.

Robinson and Leland[1] report on the surgery of the lungs under **Positive and Negative Pressure.** The claim for the use of pressure apparatus is the fact that many fatalities have occurred during operative procedures from circulatory or nerve disturbances incident

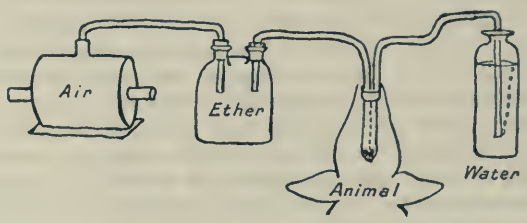

Fig. 90.—Positive pressure apparatus for thoracic surgery.

to lung collapse from pneumothorax. It has now been satisfactorily demonstrated that these fatal effects can be avoided by the use of one or another pressure apparatus. There are grave objections to negative pressure; the positive pressure method has many advantages over it.

All forms of positive pressure apparatus consist of four elements: (1) A supply of compressed air; (2) An anæsthetizing segment arc; (3) A device for introducing the same into the respiratory tract; (4) A means of varying the resistance to the exhaled air. It may be diagrammatically illustrated as in *Fig.* 90. The apparatus of the future will be very simple, as all the present complicated devices can be done without. For hospital use, it is probable that the air supply will be obtained by the use of a rotary pump, and tanks will be abolished. The rotary pump has been most satisfactory in the authors' hands.

The Anæsthetic.—Rectal administration of ether is the most simple, saves apparatus, and is frequently satisfactory. Ether is well borne in lung operations, and the authors have employed it in dogs most successfully by per-oral intubation. The resistance to expiration is

sufficiently achieved by the use of the water column, and requires no complicated devices. It is desirable to have a low resistance to the expiration tube, and high volumes of compressed air, as lung inflation should not be maintained chiefly by the resistance apparatus. When the chest is opened, the pathological inspirations which follow should be compensated for by such a volume of fresh air that it should rush in and not require to be sucked in. If the pressure to expiration is high the lungs do not collapse; but the maintenance of air exchange is quite as essential as the prevention of collapse. It is not necessary to have any complicated apparatus for rhythmically blowing up and collapsing the lungs, for if a sufficient column of air is led to the face at inspiration, it will rush as far as possible to the alveoli if the resistance to its exit is properly adjusted.

(1) The positive-pressure method, as proved by experiments, has no more pathological effect on the circulatory and respiratory functions than negative pressure. (2) The clinical operative results under positive pressure have justified its employment. (3) It possesses many advantages over the negative-pressure method. (4) Air compression should be excessive rather than insufficient, and is most conveniently supplied directly from a small rotary air-pump. (5) The anæsthetizing segment should consist of an ether bottle with side-tracking connections, and permanent joints arranged in the simplest possible manner. (Rectal anæsthesia when employed discards this portion of the apparatus.) (6) A positive-pressure apparatus should be supplied with a face mask, which in accidental pleural punctures, with subsequent dyspnœa, will amply suffice for emergency use. In most thoracic operations, it could be removed in case of vomiting without danger. (7) For extensive resections of the chest wall in the absence of adhesions, when the permanence of the air compression is essential, per-oral intubation should eventually become the method of choice. A tube for the human has not yet been perfected. (8) For animal experimentation, masking and intubation are unquestionably the methods of choice. (9) The water bottle is the preferred device for resistance, because always available and regulated with ease. (10) All forms of rhythmical artificial respiratory devices are too elaborate for universal surgical appliance. (11) Afferent air of sufficient body and pressure, with low resistance, to support the normal respiratory movements by providing air exchange and preventing collapse, is the fundamental principle of positive pressure.

In removing greater or less portions of the lung, how large a cavity can be emptied with reasonable hope that the remaining thoracic organs will compensatorily obliterate this space? Experiments on dogs show that the emptying of one side of the thorax (total pneumonectomy) is attended with almost no hope of recovery. If death does not occur early, the evacuated cavity fills immediately with serous fluid, which tapping only temporarily removes, and the eventual infection of this leads to death. In the rabbit, removal of one lung is followed by recovery, and this can be done with success without

positive pressure, whereas in the dog it leads at once to a fatal issue. Certain human beings thus resemble the rabbit in their resistance to the effect of pneumothorax, others the dog. The authors think that the probable explanation will be found in the varying resistance of the mediastinum to pressure displacement.

Willy Meyer,[2] in a paper on pneumonectomy with the aid of differential pressure—an experimental study—says the use of differential pressure had been proved. It greatly facilitated any procedure in the chest. In the discussion which followed, all the speakers recognized the serious results which had followed excision of portions of the œsophagus, partly from sepsis, but also probably from some as yet unknown physiological disturbance.

Nathan W. Green and J. W. Draper Maury,[3] in a paper on the positive pressure method of artificial respiration with its experimental application to the surgery of the thoracic œsophagus, regard the surgery of the thorax as a promising field. With improved methods of operating, the dangers of pneumothorax can be obviated. Sepsis from the divided bronchi and the opened œsophagus is still a grave difficulty. In experimental animal operations on the œsophagus, they have used a special button which makes tight apposition of the visceral surfaces without soiling of the serous surfaces. The indications for operation on the œsophagus are: Stricture of the œsophagus, carcinoma of the lower end or of the œsophago-gastric junction, diverticulum of, and foreign bodies in, the œsophagus.

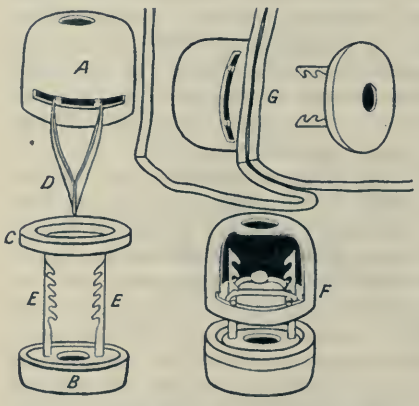

Fig. 91.—Special button for œsophago-gastric anastomosis (side-tracking operation); *A*, gastric half of button; *B*, œsophageal half; *C*, floating ring (elastic, for maintaining continuous pressure on tissues (this is made now as a spring ring); *D*, forceps for releasing spring which engages needles, *E*, *E*; *F*, complete button partially closed; *G*, method of uniting halves of button by perforating walls of œsophagus and stomach by the needles (the portion of the walls thus included between the halves of the button undergoes necrosis from pressure and sloughs out in a few days).

The details of a very satisfactory operation are: The animal under ether had one intralaryngeal cannula inserted, and held in place by a clamp pinching the tube just oral to the hyoid bone. Through the mouth were introduced, first into the stomach and then into the œsophagus, the halves of the button shown in *Fig.* 91. The œsophageal portion, being the one with the needles attached, was introduced and guarded by a long alligator-jaw forceps. This was left in place while the chest was opened at the level of the 8th rib on the left side. The 8th rib was removed, stripping from it its periosteum, as suggested by Janeway. This gives a much better

opening than the intercostal incision, and makes it far easier to close the chest at the completion of the operation. The amount of air introduced was regulated by direct inspection of the lung. The 7th and 9th ribs were pressed apart by a self-retaining retractor, and care was taken to protect the wound from contamination by a suitable covering. The diaphragm was opened in its tendinous aponeurosis, and the cardiac portion of the stomach drawn up through the opening into the chest, and sutured in place to the edges of the diaphragmatic wound. This suture was a continuous one, and several reefing stitches were taken in the stomach to one in the diaphragm. This close stitching of the stomach was found to be necessary on account of the tendency of the abdominal viscera to cause fatal prolapse into the chest. We were careful not to include the blood-vessels of the stomach in our sutures. Feeling through the stomach wall, we grasped the first portion of the button, previously introduced, and drew it through the new diaphragmatic opening into this *cul-de-sac*. The forceps were then removed from the œsophageal half, the surfaces of the stomach and œsophagus brought in apposition, and the two halves of the button pressed tightly together. They were held by the spring which engages the serrations at the side of the needles. This completed the intra-thoracic part. The chest wall was then closed in layers.

P. L. Friederich,[4] in an address on thoracic surgery, said that while pneumothorax lessened the motion of the chest, and thus aided the operator, it added a real danger by favouring collapse of the lymphatic vessels and thus aiding sepsis. The differential pressure had proved of the greatest aid in controlling hæmorrhage, and no serious operations on the chest should be undertaken without it. Lesions should be unilateral for successful surgical intervention. He described the technique of a transverse sternal thoracotomy which, after ligature of the internal mammary arteries, gave an excellent field for thoracic exploration. He thought it would be possible, with the aid of a perfect technique, to invade the heart and repair diseased valves.

Samuel Robinson[5] uses a rotary air-pump run by a $\frac{1}{6}$ horse-power motor which supplies a steady air compression with ample cubical volume of afferent air. Its work can be regulated by adjusting the speed of the motor. The use of tanks is thus avoided, and it is in other respects preferable to any of the forms of hand- or motor-bicycle pumps. Its portability is of advantage. The method he employed was the use of a steady air compression. His experiments show that in the presence of a wide-open pneumothorax, under properly adjusted air compression, changes in aortic and pulmonary blood-pressure do not occur. He thinks also that the intra-alveolar tension is no greater when produced by positive inflation than when caused by negative suction applied to the outer surface of the lung. Post-mortem examinations of the animals have shown the fears expressed of "interstitial emphysema as a result of the artificial inpumping of air" to be groundless. The most common cause of death was sepsis.

To be successful, the positive pressure apparatus must ensure a free

gas exchange in the alveoli of the lung. This cannot be brought about when the lungs are held in expansion by a strong resistance to the escape. He has therefore increased the pressure and rapidity of flow of the afferent "fresh air" by using higher compression, up to about three pounds, yielding a cubic foot of air each minute.

During the removal of a positive pressure apparatus from the face, head, or pharynx, in case of vomiting or ether spasm, the application of a thorax cup converts an open pneumothorax into a closed one, and the normal physiological conditions are more nearly maintained. This cup should be applied at the end of expiration, and thus at inspiration a partial negative intrathoracic pressure is produced. No suction need be applied to the cup.

Kuttner[6] has published an account of a series of 21 thoracic operations performed by himself in a chamber in which the atmospheric pressure can be raised or lowered at will. Under diminished pressure he operated on 17 cases, including cases of bronchiectasis, traumatic pulmonary hæmorrhage, aneurysm, cancer, and sarcoma, both of the pleura and the lung, as well as tumours of the thoracic wall. Four cases were operated upon under increased pressure. The author finds that as the result of operating under such conditions, exploratory thoracotomy is no more dangerous nor difficult than exploratory laparotomy. The use of such a chamber abolishes all risks of sudden dyspnœa, collapse, and the other unforeseen dangers which so frequently accompany extensive intra-thoracic operations. Even with an opening in the thorax of 20 cms. and more, as is necessary in operations on the œsophagus, no change in the patient's condition can be observed. The author used Sauerbruch's and Brauer's apparatus of diminished (negative) and increased (positive) pressure respectively. He recommends that ether be used as the anæsthetic; he finds it in no way dangerous. The patient should from time to time be allowed to respire a little oxygen given under pressure.

Pneumonectomy.—Rutherford Morison[7] reports a case in which a portion of lung was excised. The patient, a woman of 36, had six or eight stumps extracted under chloroform by a dentist in July, 1906. Since then she had been troubled with a cough, better at times, at others worse. Nearly two years later she was admitted to Newcastle Infirmary, pale and weak, worried by a cough, and expectorating with difficulty about a pint in twenty-four hours of offensive greenish-white fluid. A tooth stump was suspected as the cause, but Röntgen-ray examination did not confirm this.

Dr. Drummond diagnosed bronchiectasis limited to the lower part of the left lung, gave the prognosis that she could not get better, and approved of the suggestion to remove the diseased portion of lung. One hour before the operation, the foot of the patient's bed was raised, and she was encouraged to empty her bronchi by forcible coughing. Then $\frac{1}{4}$ gr. of morphia and $\frac{1}{100}$ gr. of atropine were administered subcutaneously. Chloroform was administered by Vernon Harcourt's inhaler on June 27th, 1908, and the patient was turned over to the

prone position with her left (affected) chest anteriorly pressing upon the table, and lowermost. A large, curved incision, commencing close to the edge of the sternum and ending just beyond the posterior axillary line, convex downwards, was made over the lower part of the chest, and a flap, including all the soft parts covering the ribs, was reflected upwards. A small opening was now made into the pleura, and between 1½ and 2 pints of normal saline (1 dr. of salt to 1 pint of water) at a temperature of 105° F. was slowly run into the pleural cavity. After resection of 6 in. of the 8th rib the pleura was widely opened and most of the saline escaped. After separation of adhesions and excision of more ribs, the pleural cavity was packed with gauze all round the portion of lung to be excised. This was then drawn out, clamped across with forceps, divided beyond the forceps in 4 different portions, and excised. After cleansing the divided lung surface, the lower part of the pleura was carefully packed round the lung stump and forceps, and the wound widely open was covered with a voluminous dressing. At the end of the operation the patient was in good condition, and but little shock followed it. After looking as if her recovery was assured, she died (twenty-six days after operation). Post-mortem examination showed that the wound in the chest was contracted to the size of an orange, and lined by healthy granulation. The cause of death was purulent pericarditis.

The lung was shown before the Medical Society of London. A tooth stump in a bronchus and the bronchiectatic portion excised were demonstrated.

References.—[1]*Surg. Gyn. and Obst.* May, 1909; [2]*Med. Rec.* June 12, 1909; [3]*Jour. Amer. Med. Assoc.* Sept. 5, 1908; [4]*Med. Rec.* June 12, 1909; [5]*Jour. Amer. Med. Assoc.* Sept. 5, 1908; [6]*Hosp.* May 15, 1909; [7]*Clin. Jour.* Dec. 2, 1908.

THROMBOSIS OF INFERIOR VENA CAVA.

Carey F. Coombs, M.D., M.R.C.P.

Stillman and Carey[1] record two cases of this rare disorder, and summarize the literature of the subject.

Etiology.—Four groups of causes are given: (1) Malignant growths within the abdomen extending into the vein, cancer of the kidney in particular; (2) Cachexial diseases leading to marantic thrombosis; (3) Compression of the vein, by aneurysm, fibroids, etc.; (4) Phlebitis with thrombosis, complicating general infections of pelvic sepsis, or provoked by injury. Clinically the cases fall into two groups, those in which the disease is only discovered post mortem, and those in which symptoms are present during life.

The Symptoms when present are as follows: Pain in the legs or abdomen. Œdema of the legs and genitalia, generally bilateral, and sometimes extending to the abdominal wall and even to the chest and face. Ascites is common. The liver and spleen are sometimes large, and the bowels are often relaxed. The urine only occasionally contains albumin. The temperature may be raised. The sign most valuable in diagnosis, but unfortunately not always present, is enlargement

of the superficial veins of the abdomen, through which a collateral circulation is established.

The Prognosis is bad, but a few of the infective cases (complicating enteric fever and the like) have ended in recovery.

Reference.—[1]*Amer. Jour. Med. Sci.* Mar. 1909.

THYROID, LINGUAL. *Priestley Leech, M.D., F.R.C.S.*

Stuart-Low[1] says the usual methods for removing lingual thyroids are by the **Galvano-cautery** or **Subhyoid Pharyngotomy,** or a combination of partial excision and the galvano-cautery. In a case which had been twice previously operated on at another hospital, he performed as follows: Under chloroform anæsthesia laryngotomy was done; the pharynx was plugged firmly with a captive sponge, and the anæsthetic administered through the tube. The tongue was pulled out by means of two stout silk ligatures, and was then split from tip to base and the tumour excised.

Reference.—[1]*Brit. Med. Jour.* May 20, 1909.

THYROID, SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Dunhill[1] has performed partial thyroidectomy 113 times, and mainly in cases of exophthalmic goitre. He says that if patients with exophthalmic goitre are not definitely improving under medical treatment there can be no question as to the necessity for surgical interference if one believes that the disease is a thyrotoxicosis. The risks of the operation are great, but he thinks it is as safe as any major operation in surgery, and there is no need to fear death either at or following the operation, provided it is performed under local anæsthesia. The types of thyrotoxicosis from the point of view of operation may be classified as follows: (1) Cases with all the classical signs: goitre, exophthalmos, tachycardia, palpitation, and tremor, but patients are still able to do some work. The tachycardia is constant, and palpitation frequent; they may look well or emaciated, but have no organic cardiac lesion and no œdema; frequently there is complete amenorrhœa. (2) Cases with all the classical signs, but organic changes have taken place in the heart muscle, or there is dilated heart with inefficient valves. Œdema is present, perhaps, only on walking about or in whatever part is dependent. (3) Cases in which the signs are incompletely developed, but often presenting great toxæmia. There is very little enlargement of the thyroid gland, but very marked tachycardia and a constant sensation of smothering. Exophthalmos and characteristic tremor are not present. This type cannot be called exophthalmic goitre: the term thyrotoxicosis is much more suitable. (4) Cases sometimes described as secondary exophthalmic goitre, in which it would appear that the goitre preceded the thyrotoxic condition. The thyroid gland is usually much enlarged, and the enlargement may be central or unilateral. If the patient be put to bed, it is found that tachycardia is not always present, but palpitation supervenes so constantly on the slightest exertion that the patient is practically invalided. Owing to the size of the goitre, there

is generally some pressure on the trachea, causing dyspnœa on exertion and often during sleep—frequently indeed preventing sleep. There is sometimes some prominence of the eyes, and there is usually tremor.

Response to Operative Treatment.—Cases of the first group respond rapidly and almost completely to operative treatment. In those of the second group the rapidity and completeness of the cure varies; the relief is usually in inverse ratio to the extent of the organic heart lesion. Some cases do very well, but local anæsthesia is essential. The third type is the worst, but the number of such cases is very small. The symptoms, which are out of all proportion to the enlargement of the gland, may indicate that thyrotoxicosis is a dysthyroidea and not a hyperthyroidea, an altered, and not simply an excessive, secretion. In this class removal of half the gland does not give the certain relief to symptoms that it affords in typical cases. In some cases the gland is larger than appears, as there is a part behind the upper end of the sternum. The fourth class, described by some as secondary exophthalmic goitre, consists of cases in which the nervous symptoms are secondary, not primary, as the goitre precedes the heart irritability.

When to Operate.—Treat every case medically for three months, and if there is continuous improvement, medical treatment should be persevered with. Operation should be performed as soon as it is recognized that it is practically never too late to operate, and that the operation in itself need never prove fatal if performed under local anæsthesia. In Dunhill's opinion, local anæsthesia governs the whole question as to the safety or otherwise of the operation. Under general anæsthesia it cannot be considered safe. In 88 operations for exophthalmic goitre he has only had one death; he knows of 54 deaths which have taken place during the last year in cases operated on under general anæsthesia. The other advantages of local anæsthesia are that it is easier to avoid division of the recurrent laryngeal nerve; there is no vomiting or retching; and should there be any acute thyroidism, the treatment is to saturate the patient with fluid, preferably by copious ingestion of water, and this is impossible immediately after general anæsthesia. Although his cases never suffer from acute thyroidism, he always insists on their drinking three pints of water within the first two or three hours after operation as a prophylactic.

As regards the amount of thyroid to be removed, there is some difference of opinion. Dunhill says, remove one lobe and the isthmus, and if the patient is not cured remove a portion of the other lobe later; but some months should be allowed to elapse first. There is no great danger of myxœdema if the upper and posterior portion of one lobe be left with its blood supply intact. Any crushing of the gland substance he regards as quite unnecessary and exceedingly dangerous; it is better to treat it as any other accumulation of toxic material, by allowing means of free exit for a day or two by means of a tube. Crushing is not necessary to stop hæmorrhage; a lobe may be cut across with impunity. The hæmorrhage looks alarming at first,

but the larger vessels are in the capsule and are easily picked up. Any big point on the gland surface is underrun with catgut, and sponge pressure soon stops oozing. Once when he packed with gauze, on withdrawing the gauze the second day after operation he separated a ligature from a vessel, and alarming hæmorrhage took place which necessitated opening the wound; since then he has used a tube for drainage. Gentle handling of the gland is necessary. He doubts whether the parathyroids have the importance that American surgeons attribute to them.

There was a discussion on "Thyroidectomy for Exophthalmic Goitre" at the Chicago Surgical Society,[2] and the general opinion was that general anæsthesia was better in these cases, ether being given either by the open method or by the rectum; Ferguson went so far as to say that in exophthalmic goitre local anæsthesia ought to be discarded; it might be employed in the ordinary goitre, but even in these cases the patients suffer severely while removing their goitre under local anæsthesia. (Berry—*vide Med. Annual*, 1909—employed general anæsthesia.) The onset of tetany is said to be due to tying off the superior and inferior thyroids at their origin, with subsequent necrosis of the parathyroids; the vessels should be clamped at their entrance into the gland, and the posterior capsule should be saved as much as possible to avoid damage to the parathyroids. One speaker said that in considering the operative statistics of exophthalmic goitre it is necessary to differentiate between the primary and secondary types. The primary cases—those in which the symptoms develop almost simultaneously with the enlargement of the thyroid gland—are the ones which are followed by the highest mortality. The secondary cases—those in which the exophthalmic symptoms develop upon an old, pre-existing colloid or parenchymatous or cystic goitre—can be operated upon without a much greater mortality than accompanies operations upon a simple goitre. Dr. Bouffleur was, however, in favour of local anæsthesia with β-eucaine.

Wainwright[3] reports 18 cases of simple types of goitre operated on without a single death under drop ether anæsthesia. McCosh finds the results of purely medical treatment in exophthalmic goitre rather disappointing; patients should first be submitted to medical treatment, and, if no improvement take place, either operation or serum be tried. The most effectual serums are the antitoxin and cytotoxin of Beebe and Rogers. He has removed the thyroid in over 200 cases and never paid any attention to the parathyroids, and has never seen tetany result. He thinks 65 to 80 per cent of the gland should be removed, and that three of the arteries should be cut and tied.

Branham[4] reports a case of tetany following thyroidectomy which was cured by the subcutaneous injection of parathyroid emulsion. Beef parathyroids were given by the mouth, and no improvement took place, and then an emulsion of the fresh glands in normal salt solution was prepared and injected subcutaneously. Ferguson[5] in an address before the Chicago Surgical Society said tetany is due to the

destruction or removal of the parathyroids. In man these glands are usually situated at the branching out of the superior and inferior thyroid arteries. They are encapsulated; round, oval, or reniform in shape; brown, red, or reddish-yellow in colour; and usually lie behind the thyroid gland, embedded in fat. As the parathyroids are nourished by branches coming from the thyroid arteries, it is not good surgery to tie off the main trunks of these vessels. Welch points out that the superior parathyroids are more constant as to location than the inferior. They are usually situated close to the thyroid at the middle third of its posterior border, on a level with the lower border of the cricoid cartilage and on a plane with, and behind and external to, the terminal branches of the inferior thyroid artery and the recurrent laryngeal nerve on each side. The inferior pair are at the lower pole of the thyroid on the posterior aspect of the lower third. They are on a plane anterior to the inferior thyroid artery and the recurrent laryngeal nerve; consequently they are in greater danger of injury than the superior pair. Variations in the position of these glands occur. One large parathyroid is sometimes located in the anterior surface of the isthmus, or may be found on the top of a lateral lobe or somewhere along the posterior border. Accessory glands have also been found, especially within the thymus gland and below the thyroid.

The next condition to be considered in relation to operation is hyperthyroidism, the result of very free secretion of the thyroid gland occurring in exophthalmic goitre. Clinically and experimentally it has been proved that hyperthyroidism is increased in various ways: by mental excitement, dread of the operation, and so forth. Crile, of Cleveland, reports cases of this kind where excitement increased the condition, and the patients died after operation. He therefore advises that the gland be "stolen away." The patient is put to sleep without her knowledge. Ferguson has done this in his cases, and can recommend the soundness of the advice. Every day for several days before the operation the patient is given inhalations of essential oils, and on the morning of the operation ether or chloroform—preferably the former (Crile)—is substituted for the oil without the patient's knowledge, and she goes to sleep very nicely. In this way excitement is obviated, and the mentality of the patient is eliminated as a factor. Out of 42 cases of operation for exophthalmic goitre he had 3 deaths, which he ascribed to mental excitement. In preparing his cases now, the patient is kept in a quiet, dark room, with a calm, quiet nurse, giving nourishment, alcohol sponge baths, codeine or morphine, preferably the former. He has also given Clemens' solution, and latterly 30 to 60 gr. of chloretone two hours before the operation; this makes the patient very drowsy, and she does not know anything about the anæsthesia. He began using chloretone to prevent post-anæsthetic vomiting, but it had no preventive action; its principal effect has been to calm the patients, and they go to sleep promptly and quietly within a few minutes of the beginning of the anæsthesia.

The operation he performs is as follows: A transverse incision is

made (*Fig.* 92), as it gives more room for working, and the gland can be removed with the least possible disturbance; it gives better drainage, and the scar is behind the collar. The incision is carried through the skin, platysma, sternohyoid and sternothyroid muscles, and the sternal portions of the sterno-cleido-mastoid muscles. The

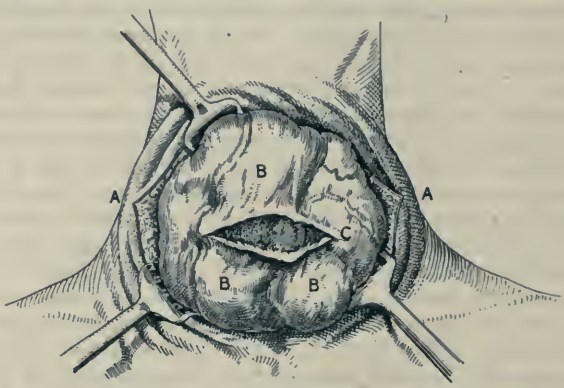

Fig. 92.—*A A*, transverse incision, *B*, thyroid gland exposed; *C*, capsule opened.

capsule of the thyroid is then opened; care must be taken in picking up the capsule to select a point where the vessels are sparse. After this has been opened, the finger is passed down alongside the gland

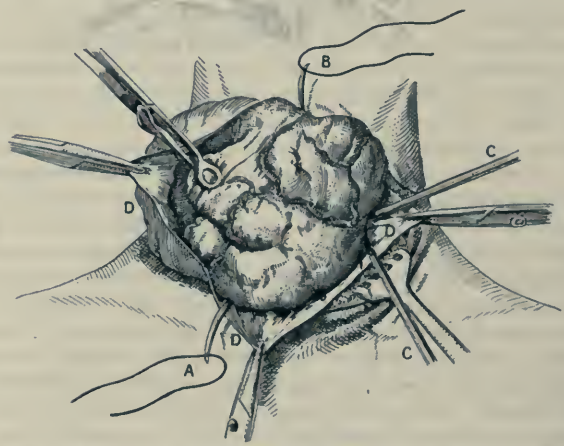

Fig. 93.—*A*, ligature for inferior thyroid vessels; *B*, ligature for superior thyroid vessels; *C* ligature carriers passed within the capsule; *D*, capsule.

until a free space is found where there are hardly any vessels, midway between the superior and inferior thyroid vessels. In the centre of the gland is a free space; this is the first landmark in the removal of the gland. A long, blunt stout needle is then passed

through the gland from without inward and downward for the inferior thyroid vessels, and then inward and upward so as to surround the superior vessels, being careful to pass through the parenchyma of the gland and not to go too close to the trachea. This is done inside the capsule of the gland. The stout catgut ligature (No. 2 or 3) is drawn through with the pedicle needle and tied, thus leaving a button of thyroid tissue at each angle (*Figs.* 93 and 94). He thinks this an advantage over the old method of leaving a large mass of tissue in one place. If it is difficult to bring the gland forwards, do not seize it with the hand, but take a solid bite in the centre of the gland with toothed cyst forceps (*Fig.* 93). This allows swinging of the gland in any direction. The ligatures being tied, the circulation in the gland is cut off, and the absorption of the liquid gland secretion is prevented. The remainder of the gland is then cut off freely. A certain amount of hæmorrhage will take place at various points, but is easily controlled

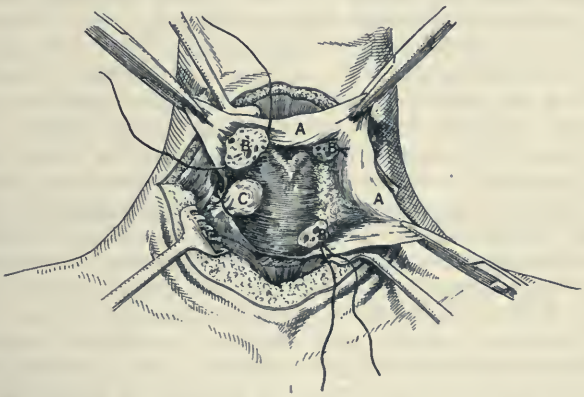

Fig. 91.—*A*, capsule; *B*, *B*, *B*, stump of gland tissue tied off with vessels; *C*, right inferior stump covered with capsule in thyroidectomy for simple goitre.

by means of forceps, ligatures, or sutures. He touches the stumps with Harrington's solution. In closing the wound, all necessary sutures are put in, but only two or three, or at most four, are tied for two or three days, which insures perfect drainage. He uses a strip of gauze surrounded with rubber tissue. The patient is given 500 cc. ($\frac{3}{4}$ pint) of normal saline solution on the table while asleep. Ferguson says this operation is speedy, and safeguards the parathyroids in the best possible manner with a minimum of hæmorrhage or shock. Injury to the recurrent laryngeal nerve is avoided by the method of tying the vessels. The surgeon should never look for either the laryngeal nerves or the parathyroid bodies. He is certain post-operative hyperthyroidism is prevented by early ligation of the vessels. Leaving a portion of the gland prevents myxœdema, and tetany will not occur when the parathyroids are not removed, or their blood supply shut off.

Hildebrandt,[6] of Berlin, says if Basedow's disease really depends

on a poisoning of the system by the secretion of the thyroid, there are two ways of meeting it: (1) By influencing the poison-producing gland to regulate its activity so that it secretes a normal juice in normal quantity; all attempts to do this have failed; (2) By administering something that will neutralize the poison; some success has been obtained in this way by administering the serum of dogs or sheep from which the thyroids had been removed. Ballet and Enriquet used the former and Moebius the latter. Merck, of Darmstadt, brought this latter into the market under the name of "antithyreodin," and several successes have been recorded after its use. The serum, however, frequently fails us, and at the present time surgery alone can deal with the condition successfully by removing the poison-producing gland. Why surgery has not made greater strides in the treatment of exophthalmic goitre is partly because it has been looked upon as a last resort, and the patients were in a very cachectic condition; the improvement only comes very slowly after operation, and often a good deal of the glandular substance remains. The results, however, have gradually improved. The mortality of the disease under medical treatment is about 12 per cent, and the most unfavourable statistics of the operation show at most the same mortality. At the same time operation must not be looked upon lightly: deaths cannot always be avoided, however much care is taken; cases of sudden death have been reported even after ligature of the arteries. Patients should be prepared for operation by prolonged rest and light diet, and surgeons should avoid operating on patients in the stage of great excitement and quick pulse. The operation is always carried out under local anæsthesia, general narcosis being avoided wherever possible. Kocher especially recommends ligature of the superior thyroid arteries as a preliminary operation, particularly in bad cases. The treatment of the patient after operation is also of great importance; he should be kept away from the excitements of his affairs, and should pass the first few months in the greatest possible quietude.

Krecke[7] agrees with Moebius that the essence of Basedow's disease is an excessive secretion of the thyroid gland. Out of 200 cases of thyroid disease he found only 5 of Basedow's disease; he has operated on 17 cases, with 1 death; usually the pulse and temperature are increased after operation, and lessening of the pulse-rate is a sign that the operation has acted favourably. He recommends general anæsthesia. He does not advise the use of X rays nor extirpation of the sympathetic.

Crile,[8] in a series of 253 operations on the thyroid, performed 4 for infections, all ending in abscess and requiring incision and drainage; 2 were in the course of typhoid fever, and gave pure cultures of typhoid bacilli; 1 followed an operation for extra-uterine pregnancy, and 1 was a sequel of influenza. There were 14 cases of malignant tumours, 9 carcinomata and 5 sarcomata; of these 1 with carcinoma and 1 with sarcoma passed the three-year limit, the others died. There was but a single death in the entire series, and in the last

120 there was no fatality. The special points of operative importance emphasized by Crile are : The anæsthetic should be given by a special anæsthetist and be preceded by a hypodermic of atropine to control the buccal and salivary secretions ; in cases of compression of the trachea with obstructed respiration, morphine-cocaine anæsthesia is the safest. The transverse incision gives the least scar and the best exposure ; the divided muscles should be sutured ; handle the gland as little as possible ; enucleate rather than excise ; leave a strip of glandular tissue at the upper and lower pole, and along the posterior border ; secure the arteries early close to the gland itself, and place the patient in the reverse Trendelenburg position, thereby lowering the pressure in the veins and reducing the hæmorrhage. If good judgment is used in selecting the stage for operation in Graves' disease, the operative mortality should be but slight, probably 2 or 3 per cent.

C. H. Mayo[9] records the mortality in 1,000 cases of goitre. Operation in colloid, simple or diffuse adenomata, and encapsulated adenomata, as a rule involve but slight risk to the life of the individual ; in his series there were in all 574 cases of this kind treated by extirpation or enucleation, with 4 deaths, one from lobar pneumonia on the eighth day, another from two severe delayed hæmorrhages, one from shock where brown atrophy of the heart was found and fatty infiltration of the liver with gall-stones, and one from septic pneumonia on the fourth day. In another class of cases he uses the term " hyperthyroidism," because he believes it will come into general use in describing a condition which manifests such varied symptoms, " and it is probable that then earlier relief will be given to many who are now treated for heart disease, nervous disease, gastric crisis, and intestinal toxæmia, until a projecting eyeball or goitre becomes sufficiently prominent to attach the label of Parry's disease, Graves' disease, Basedow's disease, or exophthalmic goitre to the unfortunate individual, who must then run the gauntlet of the enormous variety of therapeutic agents which are good for the disease when properly christened." It is probable many cases of hyperthyroidism never progress beyond the early stages and are not diagnosed as such, and it is probably true that many cases in advanced stages of the disease get well with, without, or in spite of, treatment. In Mayo's early work on this subject, beginning fifteen years ago, only the most desperate cases were thus treated, and he considered results up to the average which gave 25 per cent mortality in the first 16 cases ; better judgment in selecting a favourable moment for operation, with more careful preliminary preparation of the patient, gave only 3 deaths in the next 40 operations for the disease. During the last two years 6 cases coming to him from a distance died a medical death between the fourth and ninth day after reaching the city, their inoperable condition being recognized because of former experience. The autopsies showed degeneration of the heart muscle, fatty liver, soft spleen, chronic nephritis, and usually, enlarged thymus. One very marked case under observation dying without operation on the fifth day had no palpable thyroid

gland, and yet the autopsy showed it to be enlarged, and weighing over 3 oz. There were 405 cases of marked hyperthyroidism operated upon, with 19 deaths. Most of these (three-fourths) were treated by extirpation of one lobe. In the early stages of the disease very mild cases were treated by ligating arteries and veins at both upper poles; ligation was also done in the worst cases as a preliminary treatment in preparation for the removal of a portion of the gland later. In the most aggravated cases, where there are dilated heart, adenoma, and ascites, preliminary preparations were frequently prolonged for several weeks before the operation could be undertaken. These patients improved quickly under the various forms of treatment, such as medication, X ray, rest, etc., but they may also fail rapidly. In operating, be careful to avoid periods of gastric crisis or intestinal relaxation, and the operation may be postponed several times waiting for a favourable opportunity. There were 97 cases of hyperthyroidism treated by double ligation of the superior thyroid arteries and vein with 1 death, and 14 cases of ligation of the superior thyroid and veins of the remaining lobe, after extirpation of one lobe and isthmus were found to have improved the patient, though not to a satisfactory extent. There were 295 cases of removal of more or less of the gland, with 18 deaths, 7 of which occurred in the first 46 operations. One of these deaths occurred on the table from shock, 15 from hyperthyroidism, nearly all within 20 hours after operation, 2 from embolism, 1 pulmonary and 1 cerebral. He considers hæmorrhage, either primary or delayed, as the prime cause of death in operating for ordinary adenomatous goitre. Hæmorrhage is far more serious in the extreme cases of exophthalmic goitre with degenerated and dilated heart. As regards dangers from injury or removal of the parathyroids, he believes that with ordinary precautions and with the modern operation, such a result may be expected about as often as pulmonary embolism may be looked for in abdominal surgery. Cancer and sarcoma of the thyroid are most serious conditions; in the early stages of both a cure may be possible, but it will usually be in the unsuspected case. Cancer of the thyroid which has progressed so far as to be readily diagnosed, is practically incurable. Only 20 odd operations were made under cocaine anæsthesia; the rest had ether preceded by atropine $\frac{1}{120}$ gram and morphia $\frac{1}{6}$ gram. All but the simplest cases receive a quart of saline per rectum, given very slowly, immediately after operation. This is repeated in a few hours, and in extreme cases, again ten hours after operation. If there is intestinal relaxation, as in extreme cases of Graves' disease, the saline is given subcutaneously. Morphia is given for extreme restlessness, and if there be exhausting perspiration, give repeated small doses of atropine. Cold over the pericardial region in marked palpitation seems of benefit.

REFERENCES.—[1]*Brit. Med. Jour.* May 22, 1909; [2]*Surg. Gyn. and Obst.* Mar. 1909; [3]*Ther. Gaz.* Dec. 15, 1908; [4]*Ann. Surg.* Aug. 1908; [5]*Surg. Gyn. and Obst.* Mar. 1909; [6]*Med. Press*, Nov. 4, 1908, and also *Berl. klin. Woch.* July 20, 1908; [7]*Ibid.* Nov. 9, 1908; [8]*Jour. Amer. Med. Assoc.* July 17, 1909; [9]*Surg. Gyn. and Obst.* Mar. 1909.

TIC DOULOUREUX. *Purves Stewart, M.D., F.R.C.P.*

In last year's *Medical Annual*[1] I gave particulars of the method of treatment of tic douloureux by means of injections of **Alcohol** into the foramina of exit, at the base of the skull, through which the various divisions of trigeminal nerve emerge. Since that article was written, further observations have confirmed our opinion as to the value of the method. For example, Harris[2] recorded six cases treated in this way, and I myself[3] published a series of 20 cases, with 18 cures.

The technique of these injections, which is somewhat complicated, was fully explained in last year's *Medical Annual*. In order to elucidate the anatomical landmarks, we herewith subjoin diagrams (*Figs.* 95, 96) illustrating the points of entrance of the needle, necessary to reach the various foramina. Briefly, to recapitulate, these are as follows :—

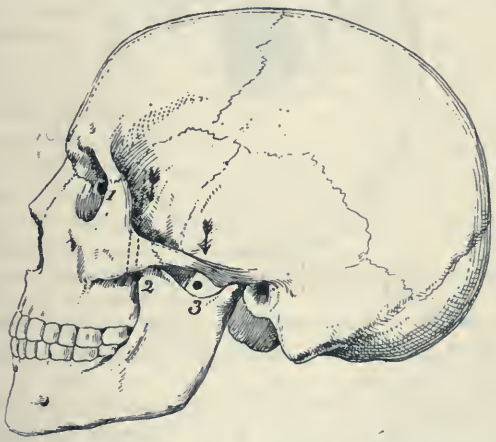

Fig. 95.—Diagram to show spots where needle is entered to reach the various divisions of the trigeminal nerve.

The first division of the nerve emerges from the skull through the sphenoidal fissure. To reach the sphenoidal fissure, our needle is introduced at the outer side of the orbit, close within the fronto-malar articulation. The blunted needle is passed along the outer wall of the orbit to a depth of $3\frac{1}{2}$ or 4 cms. Or the needle may be introduced midway between the supra-orbital notch and the outer edge of the orbit, being then passed along the roof of the orbit till it reaches the sphenoidal fissure. Care must be taken not to direct the needle near the optic foramen, lest the optic nerve be damaged.

The second division emerges through the foramen rotundum. To reach this, we mark out the posterior border of the orbital process of the malar, and prolong this line downwards to the lower border of the zygoma. The needle is inserted $\frac{1}{2}$ cm. posterior to this line, just below the zygoma, and is pushed horizontally inwards, at a level with the lower edge of the nasal bones. The foramen rotundum, in the

spheno-maxillary fossa, is reached at a depth of 5 cms. from the zygoma.

The third division emerges through the foramen ovale, immediately behind the pterygoid process of the sphenoid. To reach this, we

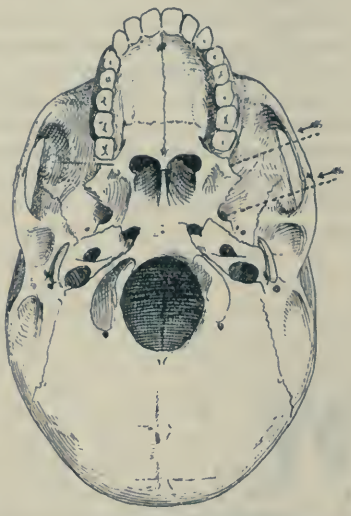

Fig. 96.—Diagram to indicate lines of puncture in reaching foramen rotundum and foramen ovale.

introduce our needle at the lower edge of the zygoma, 2½ cms. in front of the descending root of the zygoma, and push along the floor of the skull to a depth of 4 cms.

I now usually employ a solution of 75 per cent alcohol containing 2 gr. of β-eucaine to the ounce, about 2 cc. of this being injected at a time

REFERENCES.—[1]*Med Ann.* 1909; [2]*Lancet*, May 8, 1909; [3]*Brit. Med. Jour.* Sept. 25, 1909.

TICK FEVER, ROCKY MOUNTAIN. (*See* SPIROCHÆTOSIS.)

TICS. *Purves Stewart, M.D., F.R.C.P.*

A tic is a sudden motor act, which may be simple or complex, frequently repeated in an explosive fashion at irregular intervals, without rhyme or reason. It is essentially of cortical origin, i.e., it is a psychomotor act, a cortical habit. Almost any normal movement may become a tic if it is repeated often enough, irregularly and without object. When it has actually become a tic, it occurs involuntarily. Not only is the patient unable properly to restrain it, but he has an abnormal craving to perform his particular tic, and at the most can only retard its performance for a few moments. Certain conditions aggravate tics, others tend to palliate them. Thus loud sounds, violent emotions, overwork—physical or mental—the sight of other "tiqueurs," etc., aggravate a patient's tic. On the other hand,

occupations of an interesting sort, respiratory exercises, rhythmic gymnastics, all tend to diminish the tic; so also does the recumbent position, whilst every tic ceases during sleep. Powerful moral influences, e.g., the occupation of a conspicuous position at a public meeting, also have a restraining influence. Moreover, however violent a tic may be, it does not prevent the tiqueur from executing any ordinary voluntary movements, however delicate. Thus the tiqueur can feed and dress himself, he can write, draw, shave, etc., without difficulty. Suppose he has a tic of the upper limb when he is shaving, he simply stops, executes his tic, and then resumes shaving. If a tic be momentarily inhibited by an effort of will, or by the performance of a particular action or series of actions, it tends to reappear with redoubled intensity when the restraining influence is removed.

In the treatment of a tic, our first duty is to make a careful local examination so as to search for, and if possible remove, any source of peripheral irritation. Thus a tiqueur who blinks the eyes may have some conjunctival irritation, blepharitis, or Meibomian cyst, or he may perhaps have an error of refraction. Similarly, in a case of tic of the nostrils we carefully examine the nose; in a tic of the lips we search the mouth for sources of irritation, and so on. Unfortunately, however, only in a small minority of tics do we find a local exciting cause. In most cases the original stimulus has long since passed away, but the habit-spasm or tic remains. Thus a very common tic consists in an irregular twisting or tossing movement of the head. This may have originated from a movement to free the head from a tight collar, or from shaking long hair out of the eyes; yet afterwards, even with a normal collar or with short hair, the tic goes on.

We have therefore to train the patient to overcome his tic. This can be done in two ways, as described by Cruchet, of Bordeaux.[1] First we have Pitres' method by means of **Respiratory Gymnastics.** In this method, the tiqueur is made to stand upright against a wall, with trunk erect, heels together, and hands held parallel to the thighs. He is made to take a long, slow, deep inspiration, followed by a similar slow expiration, and then a pause, fourteen or fifteen times per minute, for two or three minutes at a time. These exercises are repeated every three or four hours. The duration of each séance of respiratory exercises is gradually increased day by day, until it may reach twelve, fifteen, or even twenty minutes. The intervals between the exercises are also increased until the patient performs them only four or three times daily. Then after a time, the intervals are decreased, and the exercises shortened until they ultimately cease. During the inspiratory phase, it is convenient to make the patient raise his arms slowly, whilst during expiration he slowly lets them fall. This is especially useful when there is a tic of the upper limb. If the tic is one implicating the larynx or muscles of respiration, it is convenient to make the patient recite verses, or count numbers aloud, interrupted only by deep and regular inspirations. This method in mild cases may be successful in a week or two; severe cases require months. The

physician requires patience and perseverence to attain a satisfactory result.

The second method is that of Brissaud, and has lately been described in detail by Meige and Feindel.[2] Its essential features are **Immobilization** of the muscles implicated by the tic, together with stated drilled exercises of these muscles, slow, regular, and precise, performed at the word of command. To attain immobilization of the affected muscles, the patient is made to sit down, and to make an effort to keep his affected muscles motionless, while the physician counts the seconds aloud. At first he only succeeds for a few seconds. Gradually he succeeds in maintaining immobilization for two, three, four, or five minutes. The séances are repeated four to six times daily. When the patient can maintain the muscles immobile for five or six minutes he is promoted to the standing posture, and made to perform similar immobilization drill. Then he is given certain rhythmic movements of the head, trunk, and limbs to perform during the séance, always watching that he does not interpolate his tic. When the patient has reached the stage of being able to keep his affected muscles immobile when performing ordinary rhythmic movements, he is advanced to the stage of performing actual slow and **Rhythmic Exercises with the affected Muscles.** Séances of rhythmic exercises then alternate with séances of immobilization. Thus we decrease the intervals from two or three daily to one daily, then to one in two or three days, and so on. These exercises necessarily require the physician or his assistant to be present during the séance to direct the movements. In addition, the patient can practise by himself in front of a mirror. In this way he himself gains an idea of his own progress. All these exercises must be combined with psychotherapeutics in the form of firm, kindly, and encouraging suggestions. Above all it must be impressed on the patient that he must conquer his tic by the force of his own will-power. Cure is not obtained suddenly, but gradually and irregularly, periods of improvement being followed by slight relapses, and so on. Removal from home surroundings is always advantageous; and a patient is best treated in a hospital or nursing home, not in company with other tiqueurs.

Very severe cases may require to be kept in bed at the beginning of the treatment, and to carry out the exercises there. Baths, electrical treatment, and massage are all useful adjuncts, but the most important factor for success is enthusiasm and perseverance on the part of the physician.

REFERENCES.—*Consult. méd. Franç.* 1909, No. 8; [2]*Tics and their Treatment* (English trans. by S. A. K. Wilson, 1907).

TINEA. *E. Graham Little, M.D., F.R.C.P.*

Adamson[1] describes a method of **X-Raying** the entire scalp in ringworm, by which the surface may be completely treated by five exposures, the whole scalp thus being irradiated in an hour and a half. The technique is as follows :—

1. The hair is clipped short over the whole head.
2. Five points are marked on the scalp with a blue skin-pencil.

In the middle line:
- Point *A*.—1½ to 2 in. behind the frontal margin of the hairy scalp.
- Point *B*.—1 to 1½ in. above the centre of the flat area which forms the upper part of the occiput.
- Point *C*.—Just above the lower border of the scalp at the lower part of the occiput.

At the side of scalp:
- Point *D*.—On the right side, just above and in front of the ear.
- Point *E*.—On the left side, just above and in front of the ear.

These five points are joined with lines 5 in. in length and meeting at right angles to each other. The points are to be regarded as the centre of the area to be rayed, the antikathode being placed 6½ in. from each nearest point, and the full pastille dose given, the parts not requiring treatment to be protected by lead foil.

MacLeod,[2] in refutation of statements which appeared in the lay press as to the danger of using X rays in ringworm, gives arguments derived from experience and experiment to show that X rays do not penetrate the tissues overlying the brain to any such extent as to produce injury to that organ. He presumes the use of properly prepared pastilles, and full precautions in the application to avoid over-exposure, one dose only being given to each area treated.

Odery Symes[3] reports an epidemic of tinea cruris in a boys' school in which sixteen out of forty-five boys were affected, a large-spored fungus being readily isolated from the scrapings of the skin of the thigh. The treatment adopted, which proved entirely successful, was to paint the diseased surface with a lotion composed of 40 gr. iodine, 20 gr. pot. iod., 1 oz. methylated spirit. Two applications of this, followed by the inunction, morning and evening, of an ointment containing ½ dr. precip. sulph., ½ dr. ammoniated mercury, 1 oz. lanolin, usually resulted in cure within three weeks; another successful method was to rub into the skin every night:—

R	Sulph. Præcip.	ʒss	Lanolini	
	Hydrarg. Ammon.	ʒss	Vaselini	āā ʒiv
	Acid. Sal.	gr. x		

after an application every second day of ol. terebinth, rect. The source of the outbreak appeared to be the common use of bathroom and towels, since the patients were confined to boys using a single lavatory and bathroom. After the discovery of the epidemic, the affected boys were restricted to one dormitory and lavatory, the walls of which, as well as all towels, underclothing, and running kit, were disinfected. By these means the epidemic was brought to a stop, with no recurrence, after fourteen months.

Some statistics are quoted from the Report[4] of the Metropolitan Asylums Board which are of interest. The average period of detention of the cases was 5·33 months. 508 cases were treated during the twelvemonth, of which 465 were discharged cured. Of 737 cases

admitted, 518 were classed as small-spored, 80 as endothrix trichophyton, while 139 remained unclassed owing to various causes.

Sutton[5] found the following formula useful as an antiseptic application after depilation by X rays: Iodine 1·75; pot. iod. 1·25; goose-grease 25. Another, and perhaps better, application, he found in anointing the head with tinct iodine, which is wiped off in a few minutes, and a 2 per cent aqueous solution of mercuric chloride then applied. The effect is explained as being due to nascent mercuric iodide.

REFERENCES.—[1]*Lancet*, May 15, 1909; [2]*Ibid.*; [3]*Brit. Med. Jour.* May 8, 1909; [4]*Lancet*, Oct. 10, 1908; [5]*Amer. Jour. Med. Sci.* Mar. 1909.

TINNITUS AURIUM. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

Ballance[1] reports a case in which he divided the auditory nerve for painful tinnitus. One year previously, the patient had had her semicircular canals destroyed, which had completely relieved her from vertigo from which she suffered at that time, but had had no effect on the tinnitus. Bone was removed over the right cerebellar region, and nine days later the dura was opened and the cerebellar hemisphere displaced backwards and upwards by marine-sponge pressure. On removing the sponges the cerebellum remained in its retracted position, and it was possible to identify the fifth, seventh, eighth, ninth, tenth, eleventh, and twelfth cranial nerves. The auditory nerve was then divided. On recovery from the operation there was conjugate deviation of the eyes to the left, and the eyes could not be moved to the right; this latter movement was possible two days later, but was attended by lateral nystagmus. There was some difficulty in swallowing, due to paresis of the right side of the palate and pharynx. Seen four months later, there was still nystagmus present on looking to the right; the palate, fauces, and vocal cords moved normally, and there was no longer any difficulty in swallowing. The painful tinnitus had ceased, and there was no apparent reason why the patient should not get quite well. Seen five months later, however, the patient was poorly nourished and inclined to refuse food, and had wild delusions of suspicion. There were still slight nystagmoid jerks on lateral deviation of the eyes to either side, and the right side of the pharynx was slightly weak. She stated that she had at times a buzzing tinnitus like steam, but this was not constant. She also complained of a painful dragging sensation over the right side of the head. It was obvious that the case was one of great difficulty, and complicated by superadded functional phenomena.

In the correspondence which followed the publication of the above report, a successful case was described by Milligan, in which the nerve was approached by a large osteoplastic flap in the temporal region, the temporo-sphenoidal lobe being gradually displaced and the nerve ultimately reached by working from above along the posterior surface of the pars petrosa. This route proved so difficult and tedious that this operator does not recommend it. Yearsley suggested that the

cochlea should have been destroyed rather than submit the patient to the more serious intracranial operation.

In a discussion on tinnitus aurium, Thomas Barr[2] pointed out that the most troublesome cases are those in which this symptom arises from chronic middle-ear catarrh, labyrinthine disease, or some nervous disorder. It is of great importance to attend to the general constitutional state of the patient, as the treatment of gastric and hepatic disturbances by blue pill and saline purgatives, of neurasthenia by prolonged rest and tonic treatment with strychnine and glycerophosphates, much good is effected. Bright's disease, syphilis, and diabetes are at times responsible for the condition, and require appropriate treatment. Fibrolysin had not proved very successful in the writer's practice. **Bromides** in large doses at bed-time were useful, and in labyrinthine cases **Pilocarpine** was sometimes successful. Sea air was certainly harmful, while dry, bracing, mountain air was beneficial. **Pneumo-massage** was at times of much service. The results from "**Ton-behandlung,**" a treatment in which a tuning-fork of a note far removed from that of the subjective noise is employed, was too recent for definite conclusions to be drawn as to its merit.

Lake stated that in cases of tinnitus without deafness the nose was frequently responsible for the symptom. Babinski had reported relief to thirty cases out of ninety by the use of lumbar puncture. Simple division of the tensor tympani, of the posterior fold of the membrana tympani, and the removal of the malleus and incus, were at times useful. In severe cases, total ablation or destruction of the cochlea may be performed, a procedure which had been successful in three out of four cases. It must always be remembered that tinnitus may be of central origin, in which case no operative measures will prove successful.

REFERENCES.—[1]*Lancet*, Oct. 10, 1908 ; [2]*Jour. Laryng.* Sept. 1908.

TOBACCO, EFFECTS OF. *Robt. Hutchison, M.D.*

Dixon Mann[1] cites experimental and other evidence to show that nicotine is "the sole potential poisonous constituent of tobacco smoke." In the Lancet,[2] on the other hand, it has been contended that carbon monoxide plays a large part in the production of many of the symptoms attributed to excessive smoking.

In considering the effects produced by excessive smoking, says Mann, it will be convenient to divide them into two stages, according to the severity of the symptoms—one in which no recognizable organic changes have been produced, the other in which organic changes are in progress. Such a division is obviously artificial, as the whole of the symptoms are successively continuous ; it has the advantage, however, of presenting the earlier and commoner form of the disorder in a manner that facilitates recognition. The symptoms due to the abuse of tobacco are most commonly met with in patients of from 40 to 50 years of age ; but many of the early symptoms are frequently met with at an age considerably below 40. Experience

shows that the injurious effects of excessive smoking are materially augmented by the simultaneous abuse of alcohol.

Early Stage: Functional Disorder.

The first group—in which there are no indications of organic disease—comprises those cases which are most frequently met with; but, as the symptoms are often irregular in their appearance, the true cause of the ailment may easily be overlooked. The patient usually attributes his symptoms to indigestion, which he says gives rise to flatulence, and causes palpitation of the heart. He generally lays great stress on the latter symptom, and this ought to arouse suspicion. He complains that this palpitation wakens him in the middle of the night, when he finds that his heart is beating violently, and that he feels restless and uncomfortable, and that he cannot go to sleep again until the heart has quieted down. Or perhaps he says that the palpitation prevents him going to sleep when he first lies down in bed. A "sinking sensation" in the cardiac region is often complained of, which is probably due to gastric catarrh. He may feel a sense of irritation of the pharynx which causes him to cough or to clear his throat frequently. It is only in the more advanced cases that the patient spontaneously refers to his vision as being less acute than formerly, and that objects appear as though seen through a misty atmosphere. On being questioned, however, some such complaints may be evoked; he may add that he can see better in the partially obscured evening light than in the full glare of noon. Defect of near sight is sometimes observed. Blunted colour perception when the light is feeble is not infrequently an early symptom.

Physical Examination.—The tongue is often coated; the fauces are hyperæmic, and the stomach probably dilated and filled with gas. If the arms are held out horizontally in front, the fingers or the hands frequently show some indications of tremor. The heart is usually dilated, possibly only slightly so. The pulse-rate is accelerated, and the cardiac impulse is greatly exaggerated. At this stage other physical cardiac signs will probably be absent. The action of nicotine on the heart was experimentally investigated by Esser, who found that, after repeated injections of small doses of nicotine into dogs, the cardiac muscle remained intact; and that the derangement of the heart's action was due to pronounced degeneration of the vagus. Kose attributes the quickening of the pulse to paralysis of the vagus and excitation of the sympathetic, the accelerating fibres of which subsequently become paralyzed, and then the pulse-rate becomes slower.

The most convincing diagnostic indication of chronic nicotine poisoning is afforded by the alterations in vision. The field is sometimes concentrically contracted; but of much greater importance is the presence of a scotoma for red and green, either partial or complete; the latter is only met with after prolonged excessive smoking. The presence of the scotoma may be ascertained by sitting opposite to the

patient, face to face, about a couple of feet apart, and bidding him cover one eye with the palm of the hand and then to look fixedly at your forefinger placed in front of your nose. A small red disc, about four millimetres in diameter, mounted on a short length of wire, is placed immediately in front of your forefinger and the patient is asked to name the colour. If he is unable to do so, slowly move the disc laterally to the right and then to the left until the colour is recognized in each direction. The test is repeated with a green disc in place of the red. The scotoma lies horizontally between the macula and the blind spot, and is more towards the temporal than the nasal half of the field. Green vision is the first to be affected, and is the last to return. [See *Medical Annual*, 1909, p. 260.] The ophthalmoscope does not afford much information, although Bär states that reddening and tumefaction of the papilla is typical of the early stage of tobacco amblyopia. Tachycardia frequently occurs in nicotine poisoning without the eye symptoms; in some instances amblyopia is met with without tachycardia, or they may occur together. Tachycardia alone is the most common.

Later Stage: Organic Disease.

The second group of cases—in which organic changes are in progress—has recently attracted much attention, and the relation between these changes and nicotine as the causal agent has been investigated experimentally as well as by clinical observation.

Experimental Observations.—The experimental methods consist in repeated injections into animals of small doses of nicotine, of infusion of tobacco, or of solutions of the condensation products of tobacco smoke, for prolonged periods; and then, after the death of the animal, submitting the tissues to minute pathological examination.

Baylac injected infusion of tobacco subcutaneously and intravenously into rabbits for periods comprising fifty days; arterial changes resembling those due to atheroma were produced, especially in the aorta. Adler and Hensel repeatedly injected nicotine in doses of 1½ mgrams into the ear veins of rabbits; calcification of the walls of the aorta resulted in a certain number of the animals; some, however, showed no arterial changes. Grassmann found that the injection of nicotine into animals greatly increased the blood-pressure, and caused contraction of the arterial walls, in which changes were produced closely resembling, but not absolutely identical with, the arteriosclerosis of man. Zebrowski injected solutions of the condensation products of tobacco smoke into rabbits for various periods extending up to 180 days, and produced dilatation of the aorta with the presence of platelets on its walls; he states that there is no doubt that the condensation products of tobacco smoke can produce pronounced changes in the walls of the blood-vessels. Boveri produced enlargement of the aorta with loss of elasticity of its walls by introducing infusion of tobacco, in repeated small doses, into the stomachs of rabbits; white spots were formed on the walls of the thoracic and abdominal aorta.

Clinical Evidence.—Although the subject has attracted considerable attention during the last few years, it is no new discovery. So far back as 1889, Huchard declared that without doubt tobacco can produce arteriosclerosis, angina pectoris, degeneration of the myocardium, and other circulatory disorders. About the same time, Favarger expressed a like conviction.

Erb's investigations of the causes of dysbasia angiosclerotica (intermittent limp) afford evidence that is very significant. In 1898, when discussing the etiology of that disease, he says that, from observations he has made, there can no longer be any doubt as to the important part played by excessive smoking in the causation of arteriosclerosis and of the allied conditions—contracting kidney, degeneration of the myocardium, angina pectoris, etc. This statement having been questioned, Erb subsequently, in 1904, returned to the subject, and brought forward evidence that is still more cogent than that he previously advanced in support of the views he then expressed. He tabulated a number of cases of dysbasia angiosclerotica, and showed that of 38 men who suffered from that disease, 10 were heavy smokers, and 15 were enormously heavy smokers; so that 25 smoked to excess out of a total of 38. More convincing still is his statement that in 14 of these cases excessive smoking was the sole etiological factor; all other possible causal agencies, such as syphilis, alcohol, diabetes, etc., were definitely excluded. Klemperer records two well-marked cases of arteriosclerosis which he attributes solely to excessive smoking. Neither of these men had suffered from infectious disease, nor from syphilis. They were both abstemious, and they had not been subjected to any special mental strain. One of them, aged 37, had never smoked less than thirty cigarettes, and often as many as one hundred, daily for twenty years. The left ventricle was hypertrophied; the second sound was strongly accentuated, and there was a murmur over the aorta. The radial arteries were hard and tortuous, and the pulse was of high tension. The other man, aged 44, had smoked from six to twelve cigars daily from the age of 19; between his 30th and 40th years he had never smoked less than ten cigars daily. He had suffered from a feeling of oppression of the heart for three years, and during the last six months had been attacked by severe angina pectoris. The left ventricle was moderately dilated and the second aortic sound was greatly accentuated. The radial arteries were hard and tortuous.

Klemperer states that he has seen a number of cases of arteriosclerosis in heavy smokers, but that in these cases other factors—especially severe mental strain—were concurrently present. Muskat enumerates the various causal factors of angiosclerosis as a forerunner of spontaneous gangrene, and says: "The abuse of tobacco stands prominently to the front." Simon records a case of dysbasia angiosclerotica in a man aged 64, who had not had any severe nerve strain; had not been unduly exposed to the weather; had led a quiet life; had not had syphilis, nor any serious illness, except inflammation of the cæcum eight years previously, but who had smoked thirty strong

cigarettes daily since the age of 19; he had inhaled and swallowed the smoke. The patient complained of heaviness and weakness in the legs, headache, and cardiac disturbances. The radial arteries were hard, tortuous, and sclerosed, and the pulse was of high tension. The heart was not dilated; the second aortic sound was accentuated. Pulsation in both arteries of the left foot was entirely absent; it was also absent in the posterior tibial, and only feebly present in the dorsalis pedis of the right foot.

Prolonged excessive smoking may also lead to sudden painless attacks of cardiac failure, which may even prove fatal. Mann describes an example of such an attack.

Against the view that excessive smoking can produce the results above described, it has been urged that very many heavy smokers live to advanced old age. This is undoubtedly true; but, apart from the greater evils, how many of these excessive smokers escape dyspeptic troubles, flatulence, capricious appetite, irritation of the throat, attacks of insomnia with exaggerated cardiac action, and unaccountable periods of gloom and depression? As regards longevity and immunity from vascular changes, individuality and hereditary transmission play an important part. When discussing the objection that many heavy smokers are often long-lived, Klemperer observes that the same objection may be raised against the alleged injurious effects of alcohol. Do not many habitual drunkards live to an advanced age? Do we not frequently see alcoholics die from cirrhosis of the liver without any calcification of the arteries? Some families display a tendency to arterial sclerosis; if such a tendency exists, it is undoubtedly developed by the abuse of tobacco.

It is obvious that with all physiologically active substances the question of degree is largely determinative of the results produced by any agency that is capable of affecting the health. Most men, if they choose to smoke, can do so within certain limits without injuring their health; some men can exceed such limits with apparent impunity. The extent of the limitation must be determined by each man for himself, and if he is wise he will keep well within the border-line and will hold to his resolution. Here lies the difficulty; the growth of a habit overrides discretion. The habit of excessive smoking is more insidious in its development than that of excessive drinking, for the results are much less obvious. An alcoholic may be appealed to by his friends or admonished by those in authority; this rarely happens to the adult smoker, unless he consults his doctor about "indigestion and palpitation" and admits that he smokes to excess; then probably the necessary warning will be given.

REFERENCES.—[1]*Brit. Med. Jour.* Dec. 5, 1908; [2]Quoted in *Ther. Gaz.* Nov. 15, 1908.

TOE-NAILS, INGROWING. *Priestley Leech, M.D., F.R.C.S.*

Keller[1] describes the following operation as giving good results with a minimum of treatment. Twenty-four hours before operation the foot and toes are thoroughly scrubbed with tincture of green soap;

the nail is trimmed straight across its free border and the exposed surface cleansed. Apply tincture of iodine around the entire margin of the nail, and dress with 1–2000 bichloride. At the time of operation cleanse again in the same way, and apply Harrington's solution, washing this off with sterile water. Hæmorrhage is controlled by a rubber band encircling the base of the toe. Inject weak cocaine solution under the nail from *a* to *b* and along the side from *c* to *d* (*Fig.* 97). The nail is then split with a scalpel from *a* to *b*; this in-

Fig. 97.—Keller's Operation for Ingrowing Toe-nail.

cision must go down through the matrix to the bone. The next step consists in freeing the matrix and lateral border of the nail by an incision down to the nail at *c* about $\frac{3}{16}$ in. from the lateral border extending back beyond its base. The scalpel is then carried laterally, freeing the nail from the tissues in which it is embedded. It is then directed under the freed border of the nail, and carried towards the median line, keeping close to the bone, and separating the matrix from the bone to the extent of $\frac{1}{4}$ in. toward the median line. The freed lateral border is elevated with the handle of the scalpel, and carried out over the tissues between *c* and *d*, and the matrix of the elevated portion in the same area is removed. This leaves the nail as shown in *Fig.* 98,

Fig. 98.—Keller's Operation for Ingrowing Toe-nail.

the lateral border resting on healthy tissue. A piece of gauze beneath the edge keeps it in this position, and a wet dressing of saturated solution of magnesium sulphate is applied. In infected cases the anterior corner of the elevated portion is removed and a 1–500 iodine

dressing is used instead of the magnesium sulphate. The use of the affected foot is prohibited for the first few days, and then is gradually resumed.

The following method, proposed by Prof. Rehn,[2] has been used for fifteen years. A little lint is wrapped round a piece of stick and dipped into pure perchloride of iron; this is then dabbed over the inflamed overgrown soft parts, as well as over the ingrowing part of the nail. Time must be allowed for it to sink in and work, and the lint must therefore be kept pressed on the parts for some little time. Repeat in twenty-four hours if necessary. The iron dries up the parts very quickly, the wall of inflammation shrinks, becomes hard and retracted, the nail brittle, and the pain vanishes. If a groove is cut down the length of the nail with a file or fine fret-saw fairly deep, but not deep enough to touch the quick, the nail becomes weak along this line, so that it gives there instead of forcing its way into the flesh.

Tytler[3] has had successful results in ingrowing toe-nail by the following method. A compress of lead and opium is applied for twenty-four hours; then a tape is tied round the root of the toe until intense congestion is produced. A large pair of Péan's forceps with long parallel blades is taken, and with these the nail is compressed in the middle of its inner half with moderate firmness. The toe is again wrapped in lead and opium for three days, when the inner part of the nail is found discoloured and loose, and can be easily removed with scissors without pain. To give the best results, the compression is best applied to the middle third of the half of the nail on the side affected.

REFERENCES.—[1]*N.Y. Med. Jour.* Feb. 20, 1909; [2]*Med. Press*, Feb. 17, 1909; [3]*Brit. Med. Jour.* July 17, 1909.

TONGUE, CANCER OF. (*See* MOUTH AND TONGUE.)

TONSILS, DISEASES OF. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

G. E. Waugh[1] calls attention to the fact that it is not primarily the *size* of tonsils which calls for their removal, but their *septicity*. Even in small, deeply embedded tonsils, the septicity may be of a high degree. His contention is that pathological tonsils should be dealt with surgically, upon the same general principles which underlie the treatment of other enlarged lymphatic glands, and, when necessary, completely removed by dissection. The method of removal which he advocates is as follows: The patient is first of all sent to a dentist to have any carious teeth which may be present, attended to. When ready for operation, he is placed upon a table in the recumbent position, with a firm sandbag beneath the shoulders and with the head falling slightly backwards, so that any hæmorrhage may trickle towards the nostrils rather than the larynx. At the same time extension of the head is not so great as to cause engorgement of the pharyngeal venous plexuses. A loop of stout silk is now passed through the tip of the tongue for traction purposes, and a mouth-gag

introduced between the last molar teeth (*Plate XLVI., Fig. A*). The tonsil is then seized with a Hartmann's conchotome, and drawn forwards towards the middle line. An incision is made with a fine-toothed forceps immediately external to the internal margin of the anterior pillar, where it blends with the surface of the tonsil, extending for the whole length of the free margin of the anterior pillar (*Plate XLVI., Fig. B*). This incision displays the capsule of the tonsil, which appears as a glistening, bluish-white surface (*Plate XLVI., Fig. C*). The conchotome is then readjusted, so as to get a firm hold of the tonsillar tissue, and the anterior pillar is drawn outwards by the toothed forceps. The tonsil is then readily removed from its bed, partly by traction, and partly by separating the loose cellular tissue which intervenes between the bed of the tonsil and the pharyngeal wall, by means of forceps or blunt-pointed curved scissors.

J. R. West[2] advocates complete enucleation of tonsils by first freeing the tonsil from the posterior pillar of the fauces, and completing the operation with knives instead of with écraseurs or snares. Local is to be preferred to general anæsthesia, as the hæmorrhage is thereby more easily controlled, and the patient himself is able to assist by holding his tongue down with a tongue depressor. The operation is divided into four stages, as shown in *Plate XLVII. Fig.* 99 shows schematically the position of the last bit of severed tissue connecting the capsule of the tonsil with the fascia of the superior constrictor muscle.

Fig 99.

The time taken for enucleation as above described varies with the tolerance of the patient, the amount of hæmorrhage, and the dexterity of the operator.

Frank S. Matthews[3] lays stress upon the fact that the base of a tonsil may afford a portal of entry to bacteria, just as a whole tonsil may do, and that consequently any operation which accomplishes complete enucleation should be preferred to those methods of treatment which end in merely removing portions of a tonsil. Finger enucleation of the tonsil is accomplished as follows: The palmar surface of the index or index and middle fingers is applied to the right anterior tonsillar pillar. By several strokes of the finger, the outer fibrous-tissue-covered surface of the tonsil is separated from the inner surface of the pharyngeal wall. Any adhesions to the posterior pillar are easily separated by pulling the tonsil forwards and gently rotating it. The finger is next inserted into the space made by separating the anterior pillar from the tonsil. With the finger above the tonsil, and the pillars well separated from it, the tonsil is pushed inwards towards the pharynx, and downwards towards the epiglottis, in this way stripping it laterally from the pharyngeal wall. It is now held only by a broad band of mucosa at its lower pole. This band may simply be torn through or divided by means of a tonsillotome, blunt scissors, or snare. Hæmorrhage is very seldom troublesome,

PLATE XLVI

WAUGH'S OPERATION FOR REMOVAL OF TONSILS

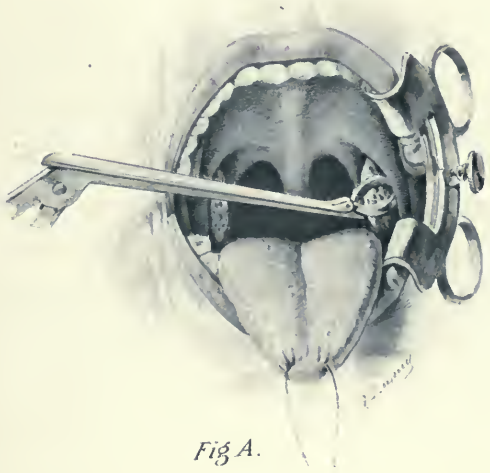

Fig A.

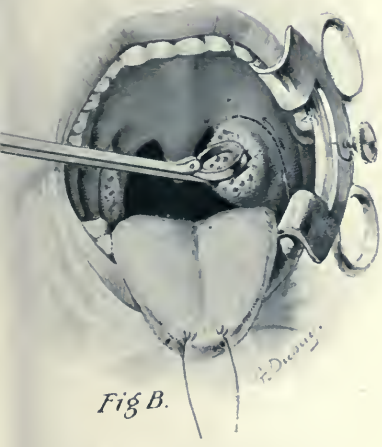

Fig B.

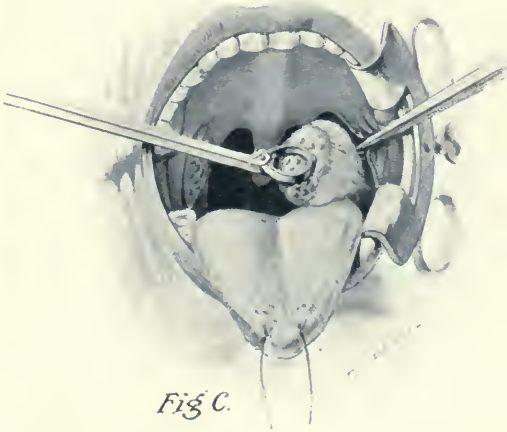

Fig C.

Fig. A.—Embedded tonsil is grasped by ring forceps. *B.*—Tonsil is drawn inwards with the embedded part bulging beneath the anterior pillar of the fauces. The dotted line indicates the line of incision down to the capsule. *C.*—Reveals the large encapsuled part of the tonsil being shelled out of its pharyngeal bed.

From drawings lent by Dr. Waugh

PLATE XLVII

WEST'S OPERATION FOR THE REMOVAL OF TONSILS

Fig. A

Fig. B

Fig. C

Fig. D

Fig. A.—Tonsil grasped with toothed forceps, and separated from the posterior pillar with an L-shaped knife. *B.*—Tonsil pulled towards the middle line, and incision made with a straight knife, beginning below at the point where first incision ended, and continuing around the tonsil to meet the first incision at its upper end. *C.*—Tonsil, now freed, is again pulled forward, and dissected from above from the loose connective tissue which separates its capsule from the superior constrictor muscle. *D.*—Should hæmorrhage be severe at this stage, it is better to complete the enucleation of the tonsil and its capsule with a blunt-pointed knife, by entering the blade into the incision made below the tonsil, and cutting upwards to meet the incision above.

the vessels being torn rather than cut through. The advantages claimed for finger enucleation are : (1) Whole tonsils are removed—a tonsillectomy ; (2) The operation is of short duration, and skill is easily acquired by any one conversant with the anatomy of the parts ; (3) It is done entirely by feeling, and the operator is not interfered with by the presence of blood or mucus in the throat.

G. Seccombe Heft,[4] in an interesting paper upon "The anatomical varieties, and their bearing on the treatment of pathological conditions of the palatine tonsils," recognizes the following clinical types : (1) The imbedded tonsil ; (2) The projecting tonsil ; (3) The flat tonsil ; (4) The hanging tonsil ; (5) Tonsils with preponderance of anterior middle or posterior masses, or a combination of these ; (6) The tonsil with marked lingual prolongation. From the therapeutic point of view it should be noted that the actual size of the tonsil has no relation to the necessity for surgical intervention. The determining factor is the presence of sepsis. The fact also that the tonsil does not project from between the faucial pillars is no proof that there may not exist a large embedded mass. The proper surgical method of removing tonsils is undoubtedly enucleation, the gland with its lingual prolongation being completely shelled out.

The importance of the tonsillar ring as a portal of entry of infectious disease is discussed by S. Rossenheim,[5] and the following conclusions tabulated : (1) That bacteria penetrate deeply into the substance of diseased tonsils. (2) That all tonsillar tissue that appears hypertrophied should be treated or removed. In the present state of our knowledge we have no method of pointing out the dangerous varieties of tonsils. (3) In all cases where there has been a history of repeated attacks of tonsillitis, this should constitute a cause for their removal, although they do not look diseased. (4) In all infectious diseases, the lymphoid tissue of the throat should be carefully examined as a possible focus of infection. (5) The marked and immediate improvement in the series of cases reported substantiates the above conclusions. (6) The organisms found in the tonsils in the cases reported are probably the causal agents of the attacks of acute articular rheumatism.

Fig. 100.—Pierce-Mueller Tonsil Snare.

For enucleation of tonsils, Narval H. Pierce[6] recommends the use of a special snare, after having freed the tonsil from the supratonsillar roof and from the upper two-thirds of the anterior and posterior faucial pillars. The snare (*Fig.* 100) consists of a flat steel bar having at its distal end a strong steel cannula with reinforced end. Notches are

cut in the upper side of the steel bar, and the lower side is milled out and contains the threaded rod for écraseur attachment. On this steel bar runs a carriage supplied with two half-curved finger-holds. In the upper portion of this carriage is an arrangement like a windlass, and by pulling back the carriage (with wire-carrier and snare loop) this windlass drops into the notches in the bar and securely locks it, and prevents it from receding and letting loose the object once grasped. On the lower side of this carriage is a lever in connection with a chuck, and this (when pulled backward) grips into the threaded rod which rests in the milled-out part of the flat bar and converts the snare into an écraseur. This new snare has none of the many springs of the older models of this type, and there is very little chance of the instrument getting out of order. To load this snare, push the carriage forward as far as it will go, by pressing on notched lever A; set the wire-carrier so that only the two holes for the wire will show, and place the ordinary snare loop in the wire-carrier. After placing the loop over the tonsil, it may either be pulled right through, or, as the carriage locks itself by means of a ratchet, may be stopped at any point. In order to set the snare as an écraseur, pull the lever below the carriage from O (open), to L (locked), then turn the ring at the end of the flat bar until the tonsil comes off. To put snare in position for reloading, unlock it and push forward on lever A.

F. R. Packard,[7] in discussing which anæsthetic to use in cases of tonsil operations, shows a decided preference for ether. He remarks that statistics gathered from all over the world show that the deaths from chloroform vastly outnumber those from ether. To support this contention, he quotes the following statistics of Gurlt :—

	Cases.	Deaths.	
Chloroform	201,224	88	1 : 2,286
Ether	42,141	7	1 : 6,020
Chloroform and ether	10,162	1	1 : 10,162
A.C.E. (Billroth's)	5,744	1	1 : 5,744
Ethyl bromide	8,967	2	1 : 4,483

Seitz's figures, reported by W. J. McCardie, are as follows :—

Pental	1 death in	200	anæsthesias
Chloroform	1 ,, in	3,000	,,
Ether	1 ,, in	5,000	,,
Ethyl bromide	1 ,, in	8,000	,,
Ethyl chloride	1 ,, in	16,000	,,

W. H. Luckett gives the following statistics :—

	Cases.	Deaths.
Chloroform	4,263	1
Ether	4,673	0
Chloroform to ether	141	0
Ether to chloroform	116	0
Chloroform and ether	164	0
Cocaine and chloroform	6	0
Cocaine and ether	10	0
Cocaine	706	0
Nitrous oxide	142	0

G. I. Stewart,[8] in discussing the relation of oral sepsis to throat disease, points out that the main symptoms of oral sepsis are redness, swelling, heat, increased secretion, and loss of function. This loss of muscular function he considers the most important symptom. He believes that the well-known open mouth and vacant expression usually attributed to adenoids and other forms of nasal obstruction is a characteristic symptom of oral sepsis, which itself may be set up by nasal obstruction. He regards the tonsil as the special adenoid (lymphatic) gland of the mouth, a tonsillitis as an adenitis, and a peritonsillar abscess as a periadenitis. When tonsils are enlarged, pathological, and incapable of performing their function, treatment should be conducted upon ordinary surgical lines: (1) Removal of the cause, which consists in the prevention or cure of oral sepsis, the extraction of septic molars, and the careful mechanical cleansing of the teeth by brushing. (2) Should removal of the cause not suffice, then the enlarged and degenerated tonsil should be removed surgically.

Tonsillitis, Follicular.—G. Fettero[9] calls attention to the value of **Aspirin** applied locally to the tonsils in acute follicular disease. The surface of the inflamed tonsils is cleansed by gentle mopping, after which aspirin is applied as follows: A cotton-tipped probe is moistened, and then dipped into powdered aspirin. With the probe thus prepared, every portion of the tonsillar surface is carefuly rubbed over. Usually three applictions of aspirin at intervals of twelve hours will be found sufficient, while at the end of thirty-six hours the patient can, as a rule, swallow with a minimum of discomfort.

REFERENCES.—[1]*Lancet*, May 8, 1909; [2]*Johns Hop Hosp. Bull.* Nov. 1908; [3]*Ann. Surg.* Dec. 1908; [4]*Lancet*, Feb. 13, 1909; [5]*Johns Hop. Hosp. Bull.* Nov. 1908; [6]*Jour. Amer. Med. Assoc.* Aug. 28, 1909; [7]*Ibid.*; [8]*Lancet*, June 26, 1909; [9]*Ther. Gaz.* Nov. 18, 1908.

TRACHEA.

W. Milligan, M.D.
D. Lindley Sewell, M.B.

G. Grey Turner[1] describes an interesting case of cicatricial stenosis of the trachea in a male patient aged 25, the result of a self-inflicted injury, cured by excision of the cicatricial mass. A complete segment of the trachea was excised, and the cut ends of the trachea carefully approximated and sutured. The part removed consisted of a complete transverse section of the trachea, with two rings, the lumen being completely obliterated by a mass of scar tissue.

REFERENCE.—[1]*Brit. Med. Jour.* June 5, 1909.

Priestley Leech, M.D., F.R.C.S.

Von Navratil,[1] of Buda-Pesth, says that, from experiments he has made on dogs, suture of the cartilage in tracheal wounds is not desirable, as it often leads to stenosis. He recommends suture of the mucous membrane of the trachea as giving much better results. If there is not sufficient mucous membrane left, remove one of the tracheal cartilaginous rings in order to get sufficient mucous membrane; this latter is tough and resistant and holds the sutures well together; it gives a good union which will not lead to stenosis.

REFERENCE.—[1]*Sem. Méd.* Feb. 24, 1909.

TRYPANOSOMIASIS (Sleeping Sickness). *J. W. W. Stephens, M.D.*

Laveran[1] recommends the combination **Tartar-Emetic-Atoxyl** in the treatment of sleeping sickness. Hypodermic injections of tartar emetic are unfortunately extremely painful, and intravenous injections hardly practicable.

H. Wendelstadt,[2] from the result of numerous experiments on animals, considers that **Arsenophenyl-glycin** (vacuum product) is an ideal preparation in the treatment of trypanosomiasis in animals.

A. Balfour[3] suggests the *intraspinal* injection of a **Serum** obtained from recovered sleeping-sickness patients or from those chemically treated. The suggestion is founded on a similar procedure adopted in cases of cerebrospinal meningitis.

REFERENCES.—[1]*Sem. Méd.* Sept. 30, 1908; [2]*Berl. klin. Woch.* Dec. 21, 1908; [3]*Lancet*, Mar. 6, 1909.

TUBERCULOSIS, LARYNGEAL. *W. Milligan, M.D.*
D. Lindley Sewell, M.B.

In discussing the subject of laryngeal tuberculosis, W. E. Casselberry[1] divides cases into the following groups: (1) The non-resistant type; (2) The hopefully resistant type; (3) The successfully resistant type, or the type capable of arrest. Treatment, whether general or local, medical or surgical, should be carefully considered in the light of these three types of cases. He concludes: (1) Tuberculous hyperplasia in the larynx has not infrequently undergone resolution, in whole or in part. (2) Unmistakable tuberculous ulcers have occasionally healed and remained healed. (3) Favourable negative qualities have characterized in common the cases which have proved to be capable of arrest or recovery; for instance, the laryngeal hyperplasia has been less progressive, less diffused, and less prone to ulceration; underlying pulmonary infection has been less extended; there were fewer tubercle bacilli, a lower pulse-rate, and less emaciation. (4) These qualities persisting, the cases which are capable at least of a hopeful resistance can be differentiated, thus justifying every effort at any sacrifice to invoke the methods likely to arrest the disease and lead to recovery, including intralaryngeal surgery when the lesions, in degree and kind, are suitable for it. (5) In like manner, the non-resistant type should be recognized, and those patients guarded from the privation and distress which surely follow in the wake of an indiscriminate exposure to the elements, and to the hardships of travel in distant climes. In them surgery is contraindicated, except to prevent air hunger and suffocation, or to prevent starvation by the removal of some particularly painful impediment in swallowing.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Aug. 7, 1909.

TUBERCULOSIS, PULMONARY. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

DIAGNOSIS.—A considerable body of statistics has now been collected which enables us to form an opinion of the merits of the various methods of specific diagnosis which have been suggested (see last year's *Annual*),

and Calmette[1] himself, in his address at the Belfast meeting of the British Medical Association, reviewed the present position.

The subcutaneous injection of tuberculin he would restrict to the rare instances in which other methods have proved inconclusive, and that on account of its inapplicability to febrile cases and its possible dangers. As a first step he advises Von Pirquet's test, the disadvantage of this method being that it fails to discriminate new lesions from old, the reaction being positive for calcified and fibrous lesions as well as for the recent. This limitation applies equally to Moro's modification. It is useless also in the adult, as statistics show that a positive reaction is given in 55 per cent of apparently healthy adults. Below three years of age this proportion falls to 4 per cent, and up to that age, therefore, the test is a reliable one.

Von Pirquet's test being positive, Calmette would next proceed, in patients above the age of three, to employ the ophthalmic test which bears his own name. This he claims as more accurate than the other, a positive reaction indicating the existence of a focus of tubercle actually in evolution or incompletely cured, i.e., one which contains some living bacilli. He allows, however, that it fails with lesions which have long been caseated, or which are very extensive or virulent, and in old cachectic tuberculous individuals. Among patients apparently healthy, the test is positive in 18 per cent.

Though allowing that precautions must be observed, he denies that any serious dangers attend its use. In 20,000 published observations he can find only 80 instances of serious accident, and many of these were due to want of care. It is no doubt true that many of the bad results reported arose from the employment of too strong solutions (Polland,[2] Teichmann[3]), to the application to a diseased eye, or too early a repetition of the test on the same eye. C. C. Heywood[4] has abandoned the use of a 0·5 per cent solution for 0·1 per cent, and even with the latter has seen ulceration result. In threatening severe reactions Teichmann recommends the application of cocaine 2 per cent and adrenalin 1–1000.

Wolff-Eisner[5] supports Calmette in the claim that a positive ophthalmic reaction means active tuberculosis. This is not, however, conceded by many observers, and among them Baldwin,[6] of Saranac, who has subjected the value of the test to an exhaustive examination, on the basis of 1087 instillations made on 887 individuals in the practice of forty physicians. In Baldwin's own words, a positive reaction cannot be interpreted as an infallible criterion of existing disease; it only betrays the presence of the infection: whether recent or long healed, must be determined by other means.

Rosenberger[7] believes that the presence of the tubercle bacillus in the blood is an almost infallible test of tuberculosis. Previous observers had demonstrated its presence both in the blood and the urine, especially in acute miliary tuberculosis, but only exceptionally in the chronic forms of the disease. Rosenberger goes far beyond this, and, on the basis of his own observations, concludes that all forms of

tuberculosis are characterized by a bacteræmia. His method consists in mixing 5 to 10 cc. of blood withdrawn from a vein with an equal volume of 2 per cent sodium citrate solution in normal saline and, after standing in a refrigerator for twenty-four hours, and laking with distilled water, staining in the usual manner.

The first 50 cases examined included 5 of acute miliary tuberculosis, 15 incipient, and the rest advanced tuberculosis. In all, acid-fast bacilli were found; in two cases inoculations, both positive, into guinea-pigs were made. Later, he had extended his observations to 312 cases, which covered not only pulmonary tuberculosis but tuberculosis of other structures—glands, bone, peritoneum, and the genito-urinary tract. In every case tubercle bacilli were found in the blood. It must be noted that no attempt was made to cultivate the organism from the blood, and at the time of writing the results of inoculation (50 cases) were incomplete. It must be noted on the other hand that, as a control, 112 cases of various other diseases were investigated, in 6 only of which were tubercle bacilli found, a finding confirmed in several of them by autopsy.

It is hardly necessary to state that these conclusions have been hotly canvassed. A. Baily,[8] inoculating the blood of 17 cases (2 miliary, 15 advanced tuberculosis) into guinea-pigs, failed in every case to infect; Ravenel and Smith[9] declare the method of no value, while Petty and Mendenhall[10] confirm Rosenberger. W. V. Brem[11] has indicated the possible source of error. Pursuing independently and previously a similar series of experiments, he also had found the presence of acid-fast bacilli, which at first he took for tubercle bacilli, almost constant. This seemed to him so remarkable that he tested his work at every step for a possible point of contamination, and found that the distilled water of the laboratory contained acid-fast, probably grass, bacilli in considerable numbers. The series of control cases, however, is strong evidence in favour of Rosenberger's view, and it has been shown that it is by no means rare (32 per cent, Beardsley[12]) to find tubercle bacilli in the urine of patients suffering from pulmonary tuberculosis apart from any gross genito-urinary lesion.

Treatment.—E. E. Prest[13] has done good service in calling attention to the paramount importance of **Rest** in the treatment of pulmonary tuberculosis, if the temperature is above the normal. He thinks we are not sufficiently strict in the matter, especially perhaps in the early stages of the disease, when the patient feels and looks fairly well, and that our laxity is responsible for a certain proportion of the chronic or more advanced cases. Rest is our chief means of controlling fever, i.e., activity of the diseased process and autoinoculation. To record the temperature accurately, it is absolutely necessary the patient should be put to bed, and the temperature taken in the rectum at 8 a.m., noon, 6 p.m., and 8 p.m.: no temperature is regarded as normal which does not fall at least as low as 97·8° in the morning and which does not rise above 99° all day, when the patient is kept absolutely at rest, including silence. By rest, absolute rest in bed is meant,

not even a reclining chair in a verandah being allowed to take the place of bed. These measures should be insisted on, and even silence imposed so long as during such treatment the rectal temperature at any part of the day rises above 100·4°. If the temperature keeps below this level, and what is especially important, is low the first thing in the morning (97·8°), the patient is allowed to visit the lavatory and rise to perform his toilet. When the stage of exercise is reached it must be only so much as will not raise the temperature (taken immediately after) above 100·4°, and this must sink with half an hour's complete rest to nearly 98·6°. Prest points out that, even with recumbency, the movements of respiration, cough, etc., will still keep up quite sufficient autoinoculation.

Vere Pearson[14] is in complete accord with Prest in these precautions, and says the pivot of successful treatment is to keep the patient at complete rest whenever any fever is present, for even slight fever means activity of the disease demanding complete rest, just as in a tuberculous lesion of any other part than the lung.

M. S. Paterson,[15] speaking at the meeting of the British Medical Association, emphasized the importance of " typhoid " rest, to use his expressive term, during fever, and bore testimony to the rapidity with which fever yields to strict treatment as compared with half measures. Fever is the expression of autoinoculation with tuberculin, and this, when excessive, as in the febrile state, must be rigidly controlled as the first step towards cure. Graduated exercise or graduated labour comes later, and is a genuinely curative measure because of the autoinoculation produced (Inman) (see last year's *Annual*), and hence must be regulated by the degree of fever produced. Latham and Inman[16] have shown, and in this they have been confirmed by Maxon King,[17] that the temperature on the whole moves inversely to the opsonic index, and is therefore a safe guide.

The use of **Tuberculin** has been further studied durirg the year. R. W. Philip[18] has never discontinued its use since its introduction in 1890, and the net result of his experience is a decisive verdict in its favour. The excessive dosage and too frequent exhibition of earlier years have been modified, and the value of smaller doses, repeated at intervals, has been recognized. A pronounced reaction, whether local or general, is to be avoided, but most observers agree that a mild reaction, local and general, is associated with progressive changes which make for improvement. Much depends on the stage and character of the lesion, and the earlier its use the more satisfactory the result. As fever itself means autoinoculation, it is evident that any use of tuberculin must be exceedingly cautious in the febrile stage, though even then, it is at times a valuable adjunct to complete rest in reducing the fever.

Crace Calvert[19] notes that the effect of tuberculin is to produce a sense of well-being, with increased appetite and weight; that the amount of cough and sputum is often diminished, that the physical signs steadily diminish, and the bacilli lessen more rapidly

than in cases on sanatorium treatment alone. Calvert usually starts with $\frac{1}{20000}$ mgram T.R.; but in cases where there has recently been fever, with $\frac{1}{40000}$ or $\frac{1}{30000}$ mgram, the maximum dose given by him being $\frac{1}{10000}$ mgram., though foreign workers in chronic cases have used much larger doses. If using the temperature and not the opsonic index as a guide, he seeks to avoid a dose which causes a rise. He considers it advisable to rest the patient for a day before, and for two or three days after, inoculation.

Ritter,[20] writing from an experience of 550 cases, says that in 35 per cent of the patients thus treated whose sputa contained tubercle bacilli, the bacilli disappeared, as compared with 25 per cent in previous years before tuberculin was employed.

Nathan Raw,[21] on the other hand, cannot support these conclusions, and has seen but little benefit conveyed in cases of phthisis by Koch's tuberculin (old or new) which is prepared from human tubercle bacilli. He holds that the tuberculous lesions of man can be divided into two groups, the one due to the action of the bacillus of the human type, the other to the bovine. To the former belongs pulmonary tuberculosis, to the latter tuberculosis of the bones, joints, etc. The lesions of the second class are benefited by human tuberculin, but for phthisis he has prepared a tuberculin of bovine origin from which he has seen good results. At the time his paper was written he had treated 27 cases of phthisis in this way; though improvement was chiefly in early cases, he speaks of four advanced cases which had done wonderfully well.

Spengler's[22] J. K. preparation contains the immune bodies set free from the red cells, which he claims as their chief seat of production; its use should be combined with sanatorium treatment, and good results are reported. S. Wolman[23] has studied the use of Marmorek's serum, but cannot confirm the excellent results observed by some writers; no adverse effects, however, were seen.

Squire and Kilpatrick[24] have tested the method recommended by Barton Wright, viz., deep muscular injections of **Mercuric Succinimide,** gr. $\frac{1}{5}$ in 10 min. of distilled water being given every second day. Their results were sufficiently encouraging, they state, to justify further trial of the remedy.

Landis and Hartz[25] speak highly of the use of **Oil of Cloves** in cases with very abundant expectoration, the amount being considerably diminished, and its expulsion facilitated. On the whole, the patients were distinctly relieved. In dry cough, on the other hand, the drug was found to be worse than useless. The following combination was employed :—

℞	Ol. Caryoph.		Ext. Glycyrrh. liq.	℥iss
	Syrup. Senegæ	āā ℥ij	Aq. dest.	ad ℥iij

A teaspoonful three times daily after meals.

References.—[1]*Brit. Med. Jour.* Aug. 28, 1909; [2]*Wien. klin. Woch.* July 9, 1908, in *Brit. Med. Jour.* Nov. 28, 1908; [3]*Med. Klin.* June 28, 1908, in *Brit. Med. Jour.* Mar. 6, 1909; [4]*Med. Chron.* Jan. 1909; [5]*Jour. Amer. Med. Assoc.* Feb. 20, 1909; [6]*Ibid.* Feb. 20, 1909; [7]*N. Y. Med. Jour.* June 19 1909; [8]*Bost. Med. and Surg. Jour.* Sept. 2, 1909; [9]Quoted in [10]

[10]*Jour. Amer. Med. Assoc.* Sept. 11, 1909 ; [11]*Ibid.* Sept. 18, 1909 ; [12]*N.Y. Med. Jour.* Aug. 14, 1909 ; [13]*Lancet*, Apr. 3, 1909 ; [14]*Ibid.* Sept. 18, 1909 ; [15]*Ibid.* Aug. 14. 1909 ; [16]*Ibid.* Oct. 31, 1908 ; [17]*Med. Rec.* July 3, 1909 ; [18]Address in Medicine at British Medical Association, 1909 ; [19]*Liverpool Med.-Chir. Jour.* July, 1909 ; [20]*Brit. Med. Jour.* Nov. 7, 1908 ; [21]*Ibid.* Oct. 10, 1908 ; [22]*Ibid.* Nov. 28, 1908 ; [23]*Johns Hop. Hosp. Bull.* Aug. 1909 ; [24]*Lancet*, July 17, 1909 ; [25]*Ther. Gaz.* June 13, 1909.

TUBERCULOSIS PULMONARY (Surgical Treatment).

Rutherford Morison, F.R.C.S.

P. L. Friedrich's[1] experiments on dogs showed that they tolerated pneumonectomy well, not only at the time of the operation, but afterwards. He found that the animals continued in excellent health, and that when they were killed, one to one and a half years later, the cavity caused by the removal of the lung was found to have become perfectly compensated, the heart taking the place of the pulmonary defect, in right-sided as well as left-sided amputation of the lung ; and also that the remaining lung shows not only an increase in volume, but in a small portion even fills the defect left by the heart on the amputated side. Moreover, the diaphragm at the site of operation helped to diminish the defect by rising higher up. The ribs on the operated side undergo atrophy, without a rib having been injured at the operation, to such an extent, that the chest wall itself helps to diminish the defect of becoming flattened and shrunken.

He also records the excellent results obtained in lung tubercle by removing almost the entire bony wall of the human thorax on the diseased side ; the ribs, from the 2nd to the 10th, were ablated from the spinal column as far as the costal cartilage at the sternum, the lung thus being made to collapse towards the hilus. The opposite lung quickly takes on the extra amount of work, but as to whether there is genuine hypertrophy of lung tissue he cannot say. Nor can he say if a tuberculous focus in the lung of the side not operated upon will undergo a more rapid evolution, or be affected in a favourable way. After satisfactory shrinkage, the re-establishment of the rib periosteal ossification is desirable, in order to counteract the bulging out of a still inflatable portion of lung in the act of coughing. A recent addition to his technique of the operation is to loosen the pleura of the lung apex as much as possible in order to get good shrinkage. He never removes the 1st rib, as it prolongs the operation and increases the risk. It is always advisable to extend the scope of the operation considerably beyond what seems to be required by the extent of the lesion. The cases should be strictly selected, and only those patients operated upon who have unilateral cavernous lesions, with at most passive foci on the opposite side. They must be free from evident recent tuberculous processes in other regions of the body, more particularly the bowel. A table is given of fourteen cases upon which he performed total pleuro-pneumolysis. At the operation he guarded against the danger of acute dislocation of the heart, by raising the arm of the affected side above the horizontal plane, and still keeping the lung of the operated side somewhat in the balance, as it were,

through the traction of the scapula and muscles, so that the effect upon the heart is allowed to manifest itself only gradually. In four of his cases, a slight scoliosis of the vertebral column has developed, with the convexity towards the side of the operation. After the operation, the amount of sputum is decreased enormously, and the irritative cough diminishes. He does not approve of operating on patients over forty years of age.

A carefully prepared list of all operations from 1844 to 1901 inclusive —73 in number—was the basis of De Forest Willard's address in 1902, "The Surgical Treatment of Tuberculous Cavities of the Apex of the Lung." The single case of **Pneumonectomy** of which the writer has been able to learn since the publication of Willard's paper is reported by Gluck.[2] Multiple costal resection, followed by excision of the lower lobe of the right lung, proved speedily fatal.

Pneumotomy, with drainage of a tuberculous cavity, does not seem to have proved of encouraging value. In 1897 Tuffier collected twenty-six cases with thirteen deaths. In the literature of the seven years which follows Willard's paper, the writer finds but four cases (Haentiens, Landerer), two of these proving immediately fatal. The writer has employed this procedure but twice, in each case draining a cavity in a lower pulmonary lobe. In the first instance a man of forty-two years suffered from a fairly large cavity in the left lower lobe. Costal resection: pleuræ found adherent; the lung was incised and the cavity entered at a depth of about 1½ in. Drainage. Improvement was but temporary; a sinus persisted, and the patient succumbed to tuberculosis in a few months. The writer's second case was a tuberculous woman 27 years of age. She gave a history of a pulmonary tuberculosis of six months' duration; she had lost in flesh and strength, and had a purulent expectoration of 6 oz. daily. She was supposed by the writer to have an encapsulated empyema just below and within the angle of the right scapula. Costal resection; pleura found adherent. Pleural separation discovered no pus. A needle thrust in the lung withdrew pus. Incision; a moderate cavity was entered at a depth of about one inch. Trabeculæ were broken down; gentle curettage was made. Drainage. Bacteriological investigation showed a mixed infection. This patient underwent a fairly speedy improvement. At the time of the last report, one year after operation, the woman had gained materially in flesh and strength; expectoration was practically *nil*. A discharging sinus persisted.

P. Harras[3] discusses the indications for chondrotomy in tuberculosis of the apex of the lung in the light of latest research. The most certain indication lies in commencing tuberculosis of the apices, with central or peripheral ossification of the 1st rib cartilage. Extension of the mischief to the level of the 2nd rib or tuberculous foci in other organs constitute a contraindication. Also without ossification shortening of the bones cannot be satisfactorily carried out, but a trial should be made with systematic pulmonary gymnastics. In any anomaly or irregular development of the ribs, whether secondary to scoliosis

or other causes, a careful examination must be made by X rays. Such complications detrimentally affect the prognosis. All operations should be followed by long-continued pulmonary gymnastics.

Mobilization of the upper thoracic wall by **Chondrotomy** of the 1st rib or first two ribs, with or without resection of the costal segment, was first advised by Freund. The upper apical portions of the lung are insufficiently aerated. This imperfect aeration creates a predisposition to apical affections of a special character, and tuberculosis is apt to begin at these points. In order to obtain a sufficient aeration of the compressed upper portions of the thorax, Freund proposed to operate upon the 1st costal cartilage, and establish pseudo-arthroses. If the tuberculous process in the apex has extended beyond the 1st rib, the patient should be denied operation.

Hofbauer opposed the views expressed by Freund, stating that this affection concerns not alone anatomical changes, but that an important part is also played by the physical side of respiration.

In the literature which has appeared since the publication of Willard's paper in 1902, the writer finds but three cases of chondrotomy. Major thoracoplastics, or **Multiple Rib Resection,** has been brought to definite notice recently by Friedrich, of Marburg. A lesser thoracoplastic procedure than that of Friedrich has been carried out of late by Mosheim and Landerer—once by the former, and six times by the latter. In one of his patients Landerer opened a lower lobe cavity on the seventh day. This patient is reported as improved at the end of two and a half months. In two of the remaining cases, improvement was noted at the time of an early report; in one case report of improvement is made ten months, and in another eight months after operation. In the remaining case arrest without improvement is noted.

Leonard Freeman,[4] writing on resection of ribs, combined with external pressure, in the treatment of tuberculosis of the apex of the lung, says in cases where climate and hygiene have failed in the treatment of pulmonary tuberculosis, the possibilities of surgery must not be lost sight of. One of the most potent factors in the cure of pulmonary tuberculosis, with or without the presence of cavities, is the gradual formation and contraction of fibrous tissue, which seems to be promoted by lung collapse and freedom from motion. Therefore any procedure favouring pulmonary retraction, as a whole or in part, should be of service. He notes the spontaneous tendency in this direction often seen in consumptives where there is subclavicular flatness, intercostal hollowing, and drooping of the shoulders; and it is suggestive that the athletic individual with well-developed and powerful thorax often exhibits the most rapid and hopeless forms of phthisis. Collapse of the lung may be obtained by (1) Artificial pneumothorax; (2) Extensive extrapleural resections of all the ribs, with removal of their periosteum; (3) Local resections of ribs, especially at the apex. The production of an artificial pneumothorax is not always possible, owing to adhesions, and to induration of lung tissue, while the second method is difficult and dangerous, and should be

employed under exceptional conditions only. The third method is applicable to obstinate troubles at the apex, and can be employed alone or in conjunction with an artificial pneumothorax. Its full benefit cannot be obtained, however, unless the removal of the ribs, which need not include the periosteum, is followed by the application of firm external pressure by an ordinary spring truss applied to the chest wall. Pads on the anterior and posterior thoracic walls are joined by a spring which fits over the shoulder of the same side operated upon. The 2nd and 3rd ribs are resected, and after the wound has healed and lost its sensitiveness, the truss is applied. He has used this device in two instances with encouraging results.

S. Daus[5] gives an historical résumé and critique of the induction of artificial pneumothorax in the treatment of phthisis. This treatment is not so new as is supposed. The priority is held by Carson. Constatt condemns this treatment in 1843 and also Pierry's method of compressing the chest with weights and straps. The theory held was that pressure by one or the other method approximated the wall of cavities, and so promoted union of them and obliteration. Pierry selected cases in which the mischief was limited to one lung or one part of a lung. Adams and Spath record cases of arrest of tuberculous advance on a natural pneumothorax forming, and draw conclusions from them that an artificial one would do likewise. Forlanini, Spengler, Gaillard, Mosheim, Steinbach, Konzelmann, have recorded cases of improvement in a tuberculous lung after a pneumothorax has formed, or after a large pleural effusion has formed and so compressed the lung. Stokes (1838) tells of a case in which, after the formation of a pneumothorax, the hectic fever entirely ceased. In 1902 an autopsy was performed in Berlin on a woman who three years before had numerous and well-marked signs of phthisis and who developed a pneumothorax. At the autopsy the lung was found exceedingly small and hard, and all tuberculous areas encapsulated and shut off, and no active tuberculous patches found. A similar case is quoted by Forlanini.

Other cases are quoted in which in every case the lung was found small, hard, and airless, containing caseous and calcified nodules and much fibrous tissue, but no active tubercle. These writers attributed the results to pressure. The prognosis is fairly good if a concomitant pneumonia does not occur in the other lung due to the mucus, etc., being squeezed out of the affected lung at the moment the pneumothorax is formed, and being drawn into the sound lung. Also the heart and other organs may be compressed. Also by the compression of vessels and capillaries causing hypertrophy and dilatation of the ventricle. A varying amount of cyanosis and dyspnœa may occur. The lymphatic circulation may also be hindered. Sepsis may occur in the pneumothorax and cause death. A circumscribed surgical emphysema of the chest wall may occur. The results by compression are not so good, as absolute immobilization of the chest is impossible.

Prof. Forlanini,[6] discussing the indications and technique of artificial pneumothorax in the treatment of phthisis, describes first the theory

of his own method. The tuberculous processes which occur in a phthisical lung are similar to those in other tissues, but the tissue destruction is greater, and when cavities have formed it is impossible for them to heal because of the movements of the lung. Now if a pneumothorax is produced the lung cannot expand, and so it is held at rest, and if the pressure of the pneumothorax is sufficiently high the walls of cavities in the lung will be approximated ; and if the lung is fixed for a long enough time healing will take place, and the tuberculous processes will not advance but rather tend to recede, and a great improvement will take place in the patient's condition.

The indications for the operation are that the mischief must be confined to one side, and there should be no adhesions between the visceral and parietal pleuræ on that side (although the pressure of adhesions is not an absolute contraindication) ; the tuberculous process must not be too acute, and other organs should not be involved. For instance, if the tuberculous processes have extended to the intestine, operative treatment of the lung would be of very little use.

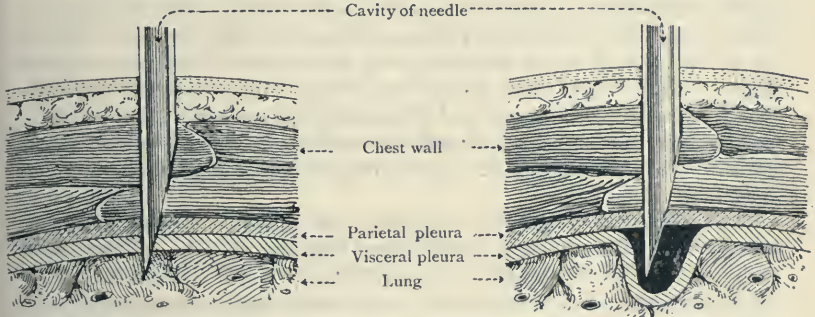

Fig. 102.—Without pressure of gas. Wound of lung.

Fig. 102.—With pressure. Layers of pleura separated.

The operation consists in opening the pleural cavity without wounding the visceral pleura and forcing into it, under pressure, some substance which will compress the lung. A reservoir for filtered gas, and some form of apparatus by which it can be compressed, and a hollow exploring needle, are all that is required. The apparatus is so arranged that by turning a cock the gas under pressure can be allowed to flow through a tube and through the needle. The only difficulty in the operation lies in the avoidance of wounding the lung. Normally the pleural cavity is only a potential cavity, and the two layers of pleura are in contact. The parietal layer must be pierced but not the visceral. The needle is passed, with all aseptic precautions, in a place where there are no adhesions between the two layers of pleura, inwards till near the pleura. The tube from the gas reservoir is then attached and gas (nitrogen) allowed to flow, and the needle is very slowly and carefully passed onwards. As soon as the point of the needle pierces the parietal pleura the nitrogen will escape through the needle and separate the two surfaces of pleura. A glance at the diagram (*Fig.* 101)

will explain it. From 200 to 400 cc. of nitrogen are allowed to flow in, and this must be repeated when necessary. Weak adhesions break down under pressure, and do not cause any trouble, but very extensive, strong adhesions prevent the collapse of the lung.

A. Schmidt, in some notes on artificial pneumo- and hydrothorax in one-sided phthisis, bronchiectasis, and aspiration illnesses, says the technique of the injection of nitrogen or air into the pleural cavity differs slightly from that used by Forlanini. A hollow needle 1½ mm. thick and 6 cm. long is used. A sharp needle is just introduced through the skin and muscle, and through this the blunt hollow needle is inserted. A monometer must be provided as a gas reservoir, one to hold 5 litres being large enough. A local anæsthetic is sufficient. Great care should be taken not to inject the air into a large blood-vessel. It is better not to complete the proceeding at one sitting; 500 cm. of air, or oxygen, is sufficient repeated several times. The pneumothorax must be complete. To ensure this, some pressure must be used, and the result should be verified by the X rays, and the pressure of air increased till a compact shadow of the lung is seen close to the sides of the bodies of the vertebræ. This condition must be kept up for a year. At first the injection must be renewed every two or three days. Later every eight to fourteen days will be found sufficient. Great difficulties are found in keeping up this treatment, and complications, such as emphysema and pneumonia, in the other lung often follow. Very few cases are met with to which this procedure is applicable.

Brauer[7] states that of sixty cases in which artificial pneumothorax was induced, good results were obtained in 45. With careful technique the production of a pneumothorax is not dangerous. It is used principally for phthisis, but occasionally for bronchiectasis. In a case of bronchiectasis the operation should not be too long delayed. Of four cases of bronchiectasis three were very much improved. In most of the phthisical cases so treated an immediate improvement manifested itself. The fever abated, but the chief result is the slowing of the lymphatic circulation from the part and a consequent diminution in the amount of toxins absorbed. The expectoration diminishes and the patient puts on weight. Contraindications are: the other lung affected, enteritis tuberculosa.

The success gained by the formation of an artificial pneumothorax in phthisis has led Wenckebach[8] to treat chronic empyemata in a similar way. The cases treated were chronic tuberculous empyemata which has resisted all other methods of treatment. The first subject was a man of 28, who had been ill for three years. During the preceding year on two separate occasions ½ litre of pus had been withdrawn from the left pleura. At the time of operation he had difficulty in breathing; the empyema had recurred and the heart was displaced towards the right. The pus contained tubercle bacilli. During the preceding month on four occasions from 1 to 2 litres of pus had been removed. At the operation a pneumothorax was made by piercing

the lung, and very soon his condition improved. On the first day a quantity of pus was removed and the lung again pierced. He left hospital much easier, but returned at three and six months to have the treatment renewed. Eight months after the first operation only 40 cc. of a clear fluid were withdrawn. X rays showed during this time an ever-increasing shadow. Four months later there was no trace of empyema or pneumothorax to be seen.

The second case was a young man of 23 who had had an empyema for eighteen months. He was so ill on admission that his physician had not dared to aspirate. There was a huge empyema on the left side, and the apex beat was outside the right nipple line. Five litres of pus were evacuated and air allowed to enter. Two days later another 5 litres were withdrawn and more air admitted. No tubercle bacilli found in the pus. Great improvement in patient's condition. On the tenth day, 1,100 cc. and on the thirty second 2,100 cc. of pus were removed. At the present moment, seven months afterwards, eleven punctures have been made since the admission of air into the lung, and on the last four only ½ litre of clear fluid was found. X ray examination at first showed adhesions at the apex which later spread all over the lung. At the end of a year and a half no signs of cavity were left.

The aim in treating phthisis by this plan is to get ultimate collapse of the lung. M. Wenckebach aims at its ultimate expansion in cases of bronchiectasis. He has tried oxygen instead of air, but without satisfactory results.

REFERENCES.—[1]*Ann. Surg.* July, 1909; [2]*Ibid.* Aug. 1909; [3]*Centr. f. inn. Med.* Mar. 27, 1909; [4]*Ibid.* July, 1909; [5]*Ther. d. Genw.* May, 1909; [6]*Ibid.* Nov. 1908; [7]*Berl. klin. Woch.* June 2, 1908; [8]*Sem. Mèd.* Aug. 18, 1909.

TUBERCULOSIS, SURGICAL. *Priestley Leech, M.D., F.R.C.S.*

Strauss,[1] who has been using **Marmorek's Serum** in the treatment of surgical tuberculosis, has come to the following conclusions: Given by the rectum it is harmless; in a series of cases its use appears to have given favourable results, and is worth a further trial. In extensive tuberculous infection (pulmonary and other tuberculosis) the results are very uncertain; nevertheless, even in these cases it may be given. Muschlitz,[2] of Philadelphia, has used **Cuguillère's Serum** in some cases of bone tuberculosis. Cuguillère and Caravia have given glowing accounts of the benefits derived from the use of this serum in all forms of tuberculosis. The composition of the serum as given by Cuguillère in the Tuberculosis Congress in Paris, in 1905, is as follows: Allylum sulphide 1 gram, tinct. of myrrh 1 gram, Hayem's glycerinated serum 100 grams. Whether this is the correct composition of the serum is doubtful. Muschlitz found that in his cases the condition of the patients at the end of the treatment was no better than at the beginning, and in two cases was worse, although they, all except one, showed general improvement for the first few weeks. He has been unable to find any published favourable results except those by Cuguillère, Faure, and Caravia.

Calot[3] says good results can be obtained from the use of **Injections** as recommended by him (*Medical Annual*, 1909, p. 591); in this article he describes the technique as needed for the injection into the various joints. Daniel,[4] in a very interesting lecture, says he has used the injection of iodoform glycerin since early in 1902, and finds it far superior to any other method of dealing with tuberculosis, and that **Bier's Congestion Method** is a very useful adjunct. In case of abscess the contents must not be forcibly expressed, as capillaries and lymphatics may be ruptured. In all cases ambulatory treatment is to be aimed at. In glands of the neck he uses congestion until an abscess is formed, and then treats it as before.

Tatchell[5] has used **Iodine Liniment** (B.P.) with good results in surgical tuberculosis. The modus operandi is as follows: The abscess or joint is operated on or scraped as usual, and the cavity is thoroughly swabbed with lin. iodi. A piece of cotton wool twisted round the end of a probe forms a good swab, and the liniment is applied every day. The application does not cause pain and does not destroy tissue like carbolic acid. Granulations do not become excessive. A thin piece of gauze is inserted after the first dressing, but not subsequently. He thinks plugs and strips for drainage have undoubtedly been responsible for many chronic sinuses. From the first he gives internally a mixture containing syrup. ferri iodidi 1 dr. and potassium iodide 5 gr. three times a day. In large phagedænic ulcers he first scrapes or foments so as to get to the base of the ulcer, and then the liniment is applied daily.

Willy Meyer,[6] of New York, records three severe cases of bone tuberculosis in adults in which a combination of **Iodoform Emulsion, Bier's Hyperæmic Treatment,** and **Open Air** yielded splendid results.

Ridlon and Blanchard[7] tried **Beck's Bismuth-vaseline Paste** in 26 cases. Beck used two mixtures; the first consisted of bismuth subnitrate 1 part and vaseline 2 parts. These were mixed while boiling, and the mixture was injected into the sinuses for the purpose of obtaining a clearly outlined skiagram of the track of the sinuses. The second mixture consisted of bismuth subnitrate, 6 parts; white wax 1 part, soft paraffin 1 part, and vaseline 12 parts. In most of the 26 cases the first mixture was injected and evacuated within twenty-four hours; the second was then injected into the fistula until it would hold no more. The temperature of the paste was high enough to give it the consistency of cream. The cases were divided into three groups. In the first the opening of the fistula healed over in from one to three weeks, and the fistula was cured, with the bismuth paste partially retained. In the secondary group the results were only partially favourable, owing to the extensive bone destruction leaving many ramifying sinuses. In the third group there was extensive bone destruction, with retained sequestra and ramifying pockets so deeply and peculiarly situated that the bismuth paste could not be forced into them, and therefore the pus could not be displaced and the results were negative. The results in tuberculous abscesses were

good, and six of the successful cases had been under the tubercular treatment by the Wright method for one and a quarter years with no change. The closing of the sinuses must not lead to any relaxation of the mechanical and other treatments in cases of progressing tuberculous joint disease.

Don[8] has also tried the injection of vaseline bismuth, but he mixed the metal with pharmacopœial ung. paraffini ; this is easily sterilized ; and it should be done before every injection. He uses either an ordinary all-glass syringe or all-metal one. For some time he has eschewed the use of the probe in sinuses, because one may carry infection from the surface ; to the deeper parts if the least force be used, it is certain that it will open up new tracts or injure neighbouring organs, besides failing to explore the branch sinuses. The bismuth mixture cannot do harm if the surgeon ceases to inject when tension and pain are felt by the patient. If it is injected under too much tension, absorption may take place and bismuth poisoning result, and the same may occur if the carbonate or oxide is used instead of the subnitrate. Besides the curative effect of the injections, the course of the sinus can be accurately delineated by the X rays after the injection. In cases of tuberculous glands, he has had very good results from the injection of **Tuberculin.** Of the varieties of tuberculin he has used several, including Koch's original tuberculin, Koch's T.R., and more recently Béraneck's tuberculin ; the last named seems worthy of special consideration. It has been his rule to commence at first with minute doses : thus, of Koch's original tuberculin 0·0001 gram, of T.R. tuberculin $\frac{1}{3000}$ to $\frac{1}{2000}$ mgram, and of Béraneck's tuberculin 0·1 cc. of a 1–100,000 solution. Dilutions are made with normal saline solution. Injection is repeated at intervals from three to fourteen days, according to the nature of the case and the effect produced. The effect is gauged by careful record of temperature, pulse, general condition of patient, and local manifestations. Although in many instances he has controlled his observations by the daily estimation of the opsonic index, he does not think this is necessary. Commence with the smallest dose that seems likely to be effective, and then proceed with treatment very gradually at sufficiently wide intervals. It is usually desirable to repeat the same dose on more than one successive occasion in order to be sure that no reaction has been missed. It is especially important to commence with small doses when the surgical lesion is internal, or if external is associated with visceral tuberculosis, e.g., pulmonary ; or when, although no internal lesion is determinable, there is much constitutional prejudice. Sometimes, when the disease is certainly external, direct introduction of tuberculin into the diseased area is to be recommended. In such cases the stronger solutions may be used. Thus of Béraneck's tuberculin he has commenced with $\frac{1}{10}$ cc. of 1–100. After injection, the affected area must be carefully observed. If there is any trace of local reaction, no further injection is made until this has disappeared. If, as commonly happens, all trace of reaction has disappeared at the

end of a week, the same dose is repeated. If no local reaction has taken place or the reaction has been slight, the dose is increased $\frac{1}{10}$ cc., and so on gradually, a pause being always made in presence of definite reaction until every trace of it has disappeared.

Steimann[9] has not had very good results as regards healing with bismuth, but he thinks it is of great use for outlining the course of sinuses and fistulæ. Rosenbach[10] has had successes and non-successes by this treatment. He warns surgeons that poisoning may take place, as has happened in several cases.

References.—[1]*Munch. med. Woch.* Oct. 20, 1908; [2]*Ther. Gaz.* June 15, 1909; [3]*Med. Press*, Mar. 31, 1909; [4]*Ibid.* Nov. 11, 1908; [5]*Brit. Med. Jour.* Feb. 12, 1909; [6]*Amer. Jour. Med. Sci.* Feb. 2, 1909; [7]*Amer. Jour. Orthop. Surg.* 1908, vi. 13, in *Amer. Jour. Med. Sci.* Dec. 1908; [8]*Edin. Med. Jour.* Feb. 1909; [9]*Münch. med. Woch.* Dec. 2, 1908; [10]*Berl. klin. Woch.* Feb. 15, 1909.

TUBERCULOUS EFFUSIONS. *George Lovell Gulland, M.D.*

O. C. Gruner[1] puts together some very useful facts in regard to the chemical composition of tuberculous effusion as a guide to diagnosis. He does not attempt to discuss the cytological characters, though he acknowledges their usefulness. The tests of special importance are as follows:—

Rivalta's Test.—A 100 cc. measure is filled with distilled water, two drops of glacial acetic acid are added, and well mixed with the water. A single drop of the fluid to be tested is allowed to fall on the acidulated water by means of a glass rod. A positive result is indicated by a trailing white cloud, which increases as the drop descends. This reaction must be present before one can affirm an effusion to be tuberculous, though it is not specific for tubercle. A negative result means no tubercle.

Müller's Test.—Add a single drop of the fluid to a little Milton's reagent in a watch-glass. If tubercle is present, the drop of fluid becomes a firm pellicle, which does not readily break up when touched with a wire, and does not stain the reagent. For this test to succeed, there must be no fibrin; there must be no blood or synovial fluid present, there must be no other organisms than tubercle, and a time limit must not be given. The explanation of the reaction lies in the fact that tuberculous fluids contain no peptonizing ferments which will destroy the proteid of the fluid.

Landolfi's Test.—If sodium iodide is given for some time before the fluid is drawn off, it will not be found in the effusion in cases of tubercle.

Reference.—[1]*Brit. Jour. of Tuber.* July, 1909.

TUBERCULOUS ELEPHANTIASIS. *E. Graham Little, M.D., F.R.C.P.*

Dujarier and Laroche[1] report an interesting case of elephantiasis of the groins, penis, and scrotum in a man aged 45, who had been long resident in North Africa. Signs of phthisis appeared at the right apex. Filaria were sought for at all hours of the day, but with negative result. After three operations, in which hard glandular masses as well as redundant portions of the skin were removed, the condition

was greatly improved. Portions of the glandular tissue removed, and of the skin, were injected into a rabbit. The glandular mass proved infective, the animal dying of tuberculosis. Histological examination of the skin and the glandular material showed nodular lymphatic infiltrations and giant cells, with absence of elastic tissue. An injection of tuberculin produced the characteristic elevation of temperature, and the local reaction at the site of inoculation.

Reference.—[1]*Rev. de Chir.* Dec. 1908.

TUMOURS, EPITHELIAL (Some Unusual).[1]

E. Graham Little, M.D., F.R.C.P.

Carcinomatous Lymphangitis secondary to Cancer of Breast.—In the case recorded under this title, a woman with some chronic disease of the breast of nine years' duration developed carcinoma. Nodules appeared on the surface of the skin over the breast and back, with reddish-brown discoloration. She died about eighteen months later, and histological examination showed a lymphatic infiltration with cancer cells in the corium, many of which had undergone fatty degeneration.

Paget's Disease of the Buttock.—The disease had been present for thirty years in a man aged 68; the diagnosis was confirmed by microscopical examination. The condition was cured by X rays.

Multiple Epitheliomata of Anus and Chest.—This patient was a man aged 72, who had had multiple lesions of a dull red colour, with scalloped margins and slightly rolled edge. They had persisted for two years. The man had had syphilis forty years previously, and the diagnosis of syphilis had been previously made. Histological examination showed typical epithelioma of the rodent ulcer type.

Tricho-epithelioma.—This occurred on the lip in a woman aged 80. It had existed two years, in close proximity to a rodent ulcer. It proved histologically to be a basal-celled epithelioma, having its origin in the lanugo-hair follicles. Clinically it was not diagnosed as epithelioma.

Coincidence of Prickle-cell Epithelioma and Rodent Ulcer.—In the case of a man aged 43, a rodent ulcer had existed for twenty years in the temporal region. A second lesion appeared on the nose eighteen years later than the first one. Microscopically, the lesion on the temple showed rodent ulcer histology, the lesion on the nose true prickle-cells in alveoli. Both lesions were cured by **Curetting** and **Galvano-cautery.**

Epithelioma of Lip in Woman.—This is uncommon. The patient was aged 48; the tumour had begun sixteen years previously, near the ala of the nose, and had involved both lips; it had ulcerated over a great part of the surface. Microscopically, it proved to be rodent ulcer, and it was healed by **X Rays.**

Reference.—[1]*Jour. Amer. Med. Assoc.* Oct. 24, 1908.

TYPHOID FEVER. *E. W. Goodall, M.D.*

Etiology.—The question of the frequency and importance of the "carrier" as a factor in the dissemination of this disease continues to be much discussed. As yet, however, the exact position of this

source of infection can hardly be said to be defined ; for the investigations required for a final determination must necessarily be prolonged. Meanwhile it may be noted that C. L. Graham, and J. E. Overlander, and Dailey[1] found at the Boston City Hospital that 23 per cent of a series of 65 typhoid patients showed typhoid bacilli in the stools and urine for ten days before their discharge ; and several outbreaks traceable to " carriers " have been recorded both in this country and abroad.

The first of which we give an abstract has been put on record by M. P. Ravenel and K. W. Smith,[2] of Wisconsin. The session of the University began on Oct. 1st, 1908. About the middle of October, fifty or sixty boarders who resided in a house containing from ninety-two to a hundred boarders were attacked with diarrhœa and nausea, and some of them were ill for several days. The majority recovered without having to seek medical advice. The cause of this outbreak was not ascertained. During the last week in October a number of the boarders became ill with symptoms of typhoid fever, and there were more than forty-one cases by November 15th. One case only occurred after that date. Three of the cases were fatal. Amongst the cases were three occurring in persons engaged in the domestic work of the house. Many of the cases were mild. In the majority Widal's reaction was obtained. During the outbreak there was only one case of typhoid amongst the students at the University who did not reside in this boarding-house, and only three or four others in the city of Madison. A thorough investigation failed to find a source for the epidemic, and so attention was turned to the possibility of its having been due to a " carrier." There were some thirteen students who were employed to scrape, wipe, and stack plates and dishes. One of these, a young man, immediately on his entering upon this work at the beginning of the session, was unwell ; on October 20th he told the landlady that he would be obliged to leave because of illness, and he did so a day or two later. He suffered from intense headache and appeared to be feverish. He went home, but getting better, returned to work at the boarding-house. On October 30th, however, he was obliged to leave on account of getting worse ; he went home, and died a fortnight later. The whole account of his illness pointed to typhoid fever, but it does not appear to have been absolutely proved that it was. This man's duties were such that he handled utensils after they had been washed. It is clear that most of the persons attacked must have been so during the first two or three weeks of October. Most of them failed during the week November 3rd to 10th. None appear to have been infected after the suspected " carrier's " departure. The account does not state whether any of the persons attacked in the middle of October with diarrhœa were also attacked later with typhoid ; but one infers, from what is related, that they were not.

Another outbreak due to a " carrier " has been well investigated by F. S. Hammond.[3] Its chief interest lies in the fact that the " carrier "

case was under observation from the attack of typhoid fever to a fatal termination from another disease one year and three months later. The patient was a coloured man, an inmate of the New Jersey State Hospital at Trenton, who when 72 years of age was attacked with typhoid fever in an epidemic that took place in the asylum. The man had a mild attack, and made a good and apparently complete recovery. The epidemic took place in July and August, 1907. The urine and stools of all the inmates who had suffered from typhoid were bacteriologically examined during the following winter and spring, and in two cases typhoid bacilli were found in the fæces during March and April, 1908. One was the old man whose case is reported. He was kept isolated and his excreta were disinfected. He continued in good health, considering his age, till a few weeks before his death on Oct. 16th, 1908, when he developed an irregular temperature and signs of thoracic disease. An autopsy revealed the cause of death to be pulmonary tuberculosis and meningitis, probably secondary to tuberculous disease of a rib. There were also chronic interstitial hepatitis and a fibroid spleen. In the gall-bladder was a small, smooth, oval calculus. Two small ulcers were found, one in the small, the other in the large intestine, both near the ileocæcal valve. Large numbers of colonies of typhoid bacilli were obtained in plate cultures of the bile, and a considerable number in those made from smears of pieces of liver. But there were none in those made from the regions of the intestinal ulcers. Though tubercle bacilli were readily demonstrated in sections of the liver fixed in alcohol, the most careful search failed to detect the presence of typhoid bacilli in the tissue of that organ. The conclusion drawn from this observation is, that the liver was infected from the gall-bladder through the bile-ducts.

A somewhat similar outbreak occurred at the Staffordshire County Asylum, Cheddleton. According to Roscoe,[4] who records the event, there were twelve cases from Sept. 26th, 1908, to March 9th, 1909. Nine of the cases occurred in one ward. Of the other three, two could be connected more or less directly with the ward, but the cause of the disease in the third was doubtful. The source of the outbreak could not be found in any defects of sanitation or in any contamination of food. In fact, after an extensive inquiry by the County Medical Officer of Health, it was finally suggested that there might have been a " carrier " in the ward. Accordingly, the blood of every inmate and of every member of the staff in the ward was, early in February, 1909, subjected to the agglutination test, and it was found that in every instance but one the reaction was negative. The exception was an old woman of 75 (M. B.), who had been admitted to the asylum on April 17th, 1908. She did not suffer from the disease in the asylum, nor could any history of her having had it, during the previous twenty years at any rate, be obtained from her relatives. In consequence of the positive reaction of the blood-serum, the old woman was placed in the isolation hospital, and remained there till she died on April 23rd. Her urine was examined on more than one occasion, but typhoid

bacilli could not be found. An autopsy did not reveal any signs of typhoid; in the lungs and elsewhere were evidence of obsolescent tubercle. In the gall-bladder were two small, black stones and a small amount of inspissated bile. The walls of the gall-bladder were contracted and thickened. The cause of death was senile decay, the blood-vessels being markedly atheromatous. The gall-bladder and its contents were sent to Prof. Leith, of Birmingham, who reported as follows: "The gall-stones did not show the presence of *Bacillus typhosus*; but the gall-bladder, besides containing the *Bacillus coli* and other germs, undoubtedly contained the *Bacillus typhosus*. From the rich bacterial content of the gall-bladder we have isolated a bacillus which gives all the reactions of the *Bacillus typhosus*, including agglutination in dilution of 1–100 with a known antityphoid serum. . . . M. B. was an undoubted typhoid carrier."

The foregoing outbreaks were institutional, and the infection appears to have been conveyed by personal contact. But the one now to be related appeared to be due to milk infected by a "carrier." It was investigated by L. L. Lumsden, of the U.S. Public Health and Marine Hospital Service, and W. C. Woodward, Health Officer of the District of Columbia.[5] From Oct. 8th to Nov. 6th, 1908, inclusive, there were reported in the District of Columbia 135 cases of typhoid fever. Of these 54 occurred amongst persons living in Georgetown (the western district of the city of Washington; at the present day the City of Washington and the District of Columbia are one). According to the latest census, the population of Georgetown was 17,168, and that of the remainder of the District of Columbia 312,423; so that whereas the population of Georgetown formed about 5 per cent of the total population of the District of Columbia, 45 per cent of the cases of typhoid fever had occurred in Georgetown, the disease being about twelve times as prevalent in Georgetown as in the rest of the district. During the twenty-five days preceding Oct. 8th, there were reported in the entire district 96 cases, only 4 of which were among the residents of Georgetown; and in the twenty-five days immediately following Nov. 1st there were 54 such cases reported in the district, only 2 of which were in Georgetown. Investigation into the distribution of the cases brought to light the fact that of the 54 cases in Georgetown 30 were among persons who during thirty days prior to the onset of their illness had consumed milk supplied by dairyman A, while 18 were among persons supplied by dairyman B. Of the remaining 6 cases, one was in a house in which two cases of the B group had occurred, and the illness had probably been contracted by personal infection. The milk supply of Georgetown was obtained from upwards of 30 dairymen, of whom the one who supplied the largest amount had only two cases amongst his customers. It was clear that there was an excessive incidence amongst the consumers of A and B's milk. A's milk was obtained from two farms, one his own in Columbia, and the other belonging to Mrs. X., in Maryland. B's supply came from 22 farms in various parts of Virginia and Maryland, and one of these

farms was that of Mrs. X. Mrs. X supplied A with 40 gallons and B with 20 gallons daily. Besides the milk supplied to A and B, Mrs. X supplied a smaller quantity (about 4 gallons) daily to eleven families who lived on the road from her farm to A's dairy. The eleven families consisted of about 55 persons all told; but in only one family was there any case suspicious of typhoid. Here a mother and two children fell ill, between Oct. 3rd and Oct. 17th, of febrile attacks of about ten days' duration. The mother was not attended by a medical man, but her blood, taken on Oct. 16th, gave a positive Widal reaction. One of the children's blood, taken on Oct. 15th, was negative. The children were said to have suffered from stomatitis; but the history of the three cases was very suggestive of typhoid fever. A most careful investigation was made, but no history of suspicious illness could be found among those who were concerned in handling the milk at A's or B's dairies, or at any of the farms supplying A and B with milk. Mrs. X's farm was the only source of supply common to A and B, and suspicion therefore rested on her farm. "The sanitary condition of the farm of Mrs. X, and the way in which milk was handled there, were such as not reasonably to preclude infection from reaching the milk (by hands of persons, by flies, etc.), if infection existed on the farm." Those engaged in milking the cows and handling the milk were Mrs. X, her son, and three hired coloured men. About 300 yards from Mrs. X's house was the house of one of these men, where he, his wife, and seven children lived; so that there were thirteen persons in all on the farm premises. No history of recent illness amongst these persons could be obtained. The last known cases of typhoid fever had occurred in the person of a school teacher who seven years previously had boarded at the farm; two or three months after his arrival he had fallen ill of that disease and died. Mrs. X. was stated to have had the disease 18 years previously (in 1890), and one of the coloured men eight years previously; but during their attacks neither of them had lived on the farm. No evidence of recent illness in the neighbourhood of the farm could be obtained.

On October 13th specimens of stools and urine from all the persons on the farm were obtained and examined; all proved negative for typhoid bacilli except the specimen of fæces from Mrs. X. This specimen showed on the endo plates a large number of colonies typical of the typhoid bacillus. Eleven of these colonies were planted in broth tubes, and every one proved by exhaustive examination to be typhoid bacilli in pure culture. On Oct. 16th the sale of milk from Mrs. X's farm was discontinued by order of the Health Officer; the last case of typhoid amongst the customers of A and B was on October 24th. Mrs. X declined to allow further examination of her stools. Mrs. X had been in the dairy-farm business for five years. Why, if Mrs. X was a "carrier," had she not infected the milk on previous occasions? On this point the authors write as follows: "One exercising ordinary care as to cleanliness of person, as Mrs. X apparently did, would not frequently contaminate directly with fæcal matter

the milk handled. Then, too, considering the number and duration of the intervals in which the fæcal matter of pronounced chronic bacillus-carriers is apparently free of typhoid bacilli, a number of contaminations with fæcal matter might be necessary before infection would occur in which organisms alive and virulent, and sufficiently hardy to survive, would be introduced into the milk. . . . . The contamination of the milk with typhoid bacilli having once occurred, it is readily conceivable that the infection would survive on the dairy utensils, and so more or less constantly infect the milk for some days or even weeks." [The insanitary state of the surroundings would have allowed of such an occurrence.]

The case reported by Huggenberger,[6] of Zürich, is of a different class. Here the "carrier" was supposed to have been the cause of a series of cases spread over thirty-one years. The first case, which subsequently became the carrier, was a woman, who went through an attack of typhoid fever in 1877. Her husband suffered from the disease in 1886, a son in 1892, a daughter-in-law in 1902, and nine servants during the years 1899 to 1908. No ordinary cause for these illnesses could be found. The servants' room had several times been changed, and the family had moved first into a new house and then into another flat in the same house; but typhoid fever followed it. The excreta of all the members of the family were examined bacteriologically, and the fæces of the woman who had been ill in 1877 were found to contain virulent typhoid bacilli. "As medicinal methods of disinfection of the intestines are either dangerous or untrustworthy, the lady in question was recommended to have her motions carefully disinfected, to disinfect bed-clothes and under-clothes, to wash her hands with an antiseptic solution, and to keep away from the kitchen premises."

It has been known for a considerable time that typhoid bacilli could be obtained from the bile in the gall-bladder long after a person had suffered from typhoid fever. James Miller[7] discusses the path by which the bacilli reach the bile. He made microscopical examination of the organs in a fatal case of typhoid fever, a man aged 28, and found, besides masses of bacilli in the mesenteric glands and spleen, these organisms in the bile-ducts, gall-bladder, and liver. Sections of the common duct showed shedding of the epithelium, with masses of bacilli, not only in the lumen but also in the submucous tissue. The hepatic duct had the same appearance, though to a less degree. In the gall-bladder it was found that the epithelium was entirely absent from the villi, and bacilli were seen in the recesses between the villi and also scattered irregularly through the submucous tissues, bearing no relationship to the vessels. In the liver the larger bile-ducts showed shedding of the epithelial lining, but bacilli in the ducts were few and far between. Necrotic areas were numerous and large. In one of these necrotic areas an enormous mass of bacilli was found. Typhoid bacilli were obtained in pure culture from the interior of the gall-bladder. Bacilli can reach the gall-bladder (1) by way of the

intestine, (2) by embolic infection of the wall of the gall-bladder, and (3) from the liver. Miller states that the weight of experimental evidence is against (1); and refers to Chiari's[8] observation that the *Bacillus typhosus* is found in pure culture in the gall-bladder. If the bacillus comes up the bile-ducts from the duodenum, why do not other organisms also pass that way? As regards (2), Chiarolanza[9] found that when rabbits were injected intravenously with typhoid bacilli, the organisms were subsequently found in the gall-bladder in 74 per cent of the cases. (In animals injected subcutaneously, bacilli were never found in the gall-bladder.) Microscopic examination of the wall of the gall-bladder revealed emboli of typhoid bacilli in the vessels, even in cases where the cystic duct and common bile-duct had been ligatured before the injection. (It is interesting to note that in these cases the bacilli were also found in the duodenum and small intestine.) The case examined and reported by Miller supports the third possibility, infection from the liver. The author makes the statement that "necrotic areas (in the liver) are as a rule numerous, but bacilli are not found in connection with them." There is also experimental evidence to show that the bacilli can pass from the circulating blood into the bile. The taurocholic acid of the bile favours the growth and persistence of the bacilli in that fluid.

Since the existence of the typhoid carrier has been discovered, the question has naturally arisen how he is to be dealt with; and it has been suggested that he might be freed from bacilli by the injection of an appropriate **Vaccine.** A case in which this method was adopted apparently with success has been put on record by Irwin and Houston.[10] The "carrier" was a young woman, aged 26 years, a domestic servant, who seven years previously had suffered from an attack of typhoid fever. Since the illness she had never been perfectly well; she easily became tired, and frequently suffered from headache and gastric attacks. Further, during the seven years since she was ill with typhoid, six persons fell ill with that disease in three different places and three different families in whose service she was, four in one house and one each in the two others. She was therefore suspected of being a "carrier," and was admitted to the Royal Victoria Hospital, Belfast, for observation. Her blood agglutinated the laboratory strain of bacilli well in solution of 1–10 and 1–20, but only feebly in 1–50. From the patient's urine the *Bacillus typhosus* was recovered; and this strain was agglutinated well by a 1–10 dilution of the patient's serum, but only feebly with higher dilutions. The bacilli occurred in the urine in enormous numbers, with pus and epithelial cells. No typhoid bacilli were found in the fæces. The temperature of the patient, taken four-hourly, varied from 98° to 100° F. On admission her weight was 8 st. 13 lb. She was kept for five weeks under the treatment of tonics, urinary antiseptics, and rest. But no improvement took place, and her weight fell to 8 st. 11 lb. She continued to suffer from headache and gastric pain, and her urine continued to contain large quantities of typhoid bacilli. It was then determined

to treat the patient with a typhoid vaccine. Accordingly a vaccine was prepared from a growth of typhoid bacilli that had been isolated from the patient's urine. On August 25th, 1908, 50 millions of bacilli were inoculated. This gave rise to a higher range of temperature for a day or two, with malaise and headache. On Sept. 1st, bacilli were still present in the urine. On Sept. 2nd, 100 millions were inoculated. On Sept. 16th, bacilli were still present in the urine, but in fewer numbers. On Sept. 20th, 200 millions were inoculated. On Sept. 22nd, there were as many bacilli in the urine as before the inoculations were begun. The patient was put on **Sodium Lactate** in order to make her urine alkaline. On Oct. 8th, no typhoid bacilli were to be found on the plates sown with the urine. On Oct. 9th, 300 million bacilli were inoculated. On Oct. 20th, there were no bacilli in the urine. On Oct. 23rd, 50 millions were inoculated. On the 24th, the urine was absolutely clear; there was no pus and no albumin, and no colonies developed on the plates. On Nov. 21st, the patient (who had meantime left the hospital and gone into the country) came up for observation. No typhoid bacilli could be found in the urine or fæces. On that day 1000 million bacilli were inoculated. On Nov. 23rd, no bacilli grew on the plates sown with the urine, and no bacilli could be found in the fæces. The patient's blood now gave a well-marked Widal's reaction in dilution up to 1–200. Her weight had increased to 9 st. 11 lb., and the symptoms previously mentioned had quite disappeared. The authors refer to another case, published by them ten years previously,[11] of chronic cystitis in a woman which was found to be due to the typhoid bacillus.

With respect to the administration of sodium lactate, the authors make the following observations: "After the second inoculation, when the opsonic power of the blood had had time to rise, the urine was made alkaline by giving sodium lactate by the mouth, and we were of the opinion that this procedure aided the action of the blood in clearing the urinary tract of typhoid bacilli. In a large number of cases of acute pyelitis with a rise of temperature, it has been often observed that the temperature falls whenever the urine is made alkaline by such drugs as citrate of potassium, lactate of sodium, etc., and this treatment alone may effect a cure in some cases. The essential point seems to be the neutralization of the urine, as the temperature is apt to rise again if the urine is allowed to become acid. On the other hand, in chronic cases without a rise of temperature, the neutralization of the urine has usually little effect." The authors made some opsonizing experiments which went to show that when the opsonic mixture was acid there was a great decrease in phagocytosis; and they conclude that "when the immunizing power of the blood has been increased by therapeutic inoculation, the phagocytosis of the bacilli should be aided (in cases of acute pyelitis, cystitis, etc.) by rendering the urine neutral or faintly alkaline."

Pathology.—In a valuable article on "Typhoid Bacilluria," Karl Connell,[12] of New York, reviews the literature, and gives a detailed

account of a number of experiments performed by himself. The paper is full of detail; the following summary of it is given by the author. (1) Typhoid bacilli are present in the urine of at least 24 per cent of all cases of typhoid fever. (2) They are usually found in enormous numbers, appearing at about the time that the temperature falls to normal; and they continue in varying intensity, sometimes intermittently, usually for several weeks, tending to disappear spontaneously. (3) The bacilluria arises from infection of the bladder urine from the blood, probably by way of the kidney. (4) Typhoid organisms multiply most rapidly in urine of low acidity. Highly acid urine is inhibitory principally because of the organic acidity. The urine at the height of the fever is usually highly acid and a poor medium; that of the declining stage is low in acid and a good medium for the growth of typhoid bacilli. (5) Atony and over-distention of the bladder, and the presence of residual urine, are occasionally factors in permitting the typhoid bacillus to become established in the bladder urine. (6) Severe cases of typhoid fever are more subject to infection of the urine than milder cases. (7) The eruption bears no consistent relation to the bacilluria. (8) Albuminuria is not essential to the establishment of the bacilli in the urine. Albumin, however, enriches the urine as a culture medium, and indicates such renal damage as might more readily allow the passage of bacteria from the blood. (9) Absence of subjective symptoms is the rule. Objective signs are usually present at some period of the infection; such signs as slight or moderate turbidity of the urine, a shimmer on swirling in a test-tube, or the presence of a small amount of pus. The only dependable sign is the presence of the bacillus, proved by culture from the catheterized or cleanly passed urine. (10) Complications are rare. True cystitis, occurring during typhoid fever, is usually due to some organism other than the typhoid bacillus. Acute typhoid cystitis does occur; and a few cases of pure typhoid infection causing a chronic ulcerative cystitis are recorded, as also are chronic infections of the kidney. (11) The bacilli usually disappear spontaneously. The eliminative agents seem to be, first, an inhibition of growth due to an increased acidity of the urine in the stage of active convalescence, and second, increased power and completeness of urination. (12) The typhoid organism in the urine is virulent. (13) For diagnosis in a case of suspected typhoid fever, bacteriological examination of the urine is rarely of value.

The writer concludes: (1) Typhoid bacilluria is a great menace to public health. Of all excretions containing typhoid bacilli, the most dangerous is the urine of the declining and postfebrile stage of typhoid fever. The fæces are a greater public menace during the active stage of the illness, but taking the course of typhoid fever as a whole, the urine is probably the great spreader of this disease. However, in chronic typhoid-bacillus carriers, the bile more frequently than the urine is the medium in which the bacteria have perpetuated themselves. (2) As a routine in every case of typhoid fever, during the

decline and convalescence, the urine in the bladder should be rendered inhibitory to the growth of typhoid bacilli. Bacilluria once established should be terminated by urinary antiseptics or by irrigation of the bladder. Obstinate ulcerative cystitis should be treated by surgical drainage. The passed urine of the typhoid fever patient at all stages of the illness should be disinfected with the same care as the fæces.

In a paper on the *Bacillus coli communis* as a cause of an infection clinically identical with typhoid fever, Coleman and Hastings[13] narrate two cases, and discuss at length the agglutination reactions for the coli bacillus. The paper is too long to abstract satisfactorily here; it contains a good bibliography, and should certainly be consulted by all who are interested in the study of infections caused by the coli group of organisms.

C. H. Lawrence[14] has reported a case in which typhoid bacilli were found in the milk of a woman who was attacked by typhoid fever when she was suckling a child three months old.

Two cases, one fatal and examined post mortem, of nephro-typhoid, or typhoid fever in which the brunt of the local infection is borne by the kidneys, are reported by Giordano.[15] There were no ulcers in the intestine in the fatal case.

Six cases of ascites, a rare condition in typhoid fever, will be found detailed in a paper by McPhedran (Toronto).[16] In one case the cause of the ascites was probably super-added tuberculous disease. In none of the cases was the ascites extreme.

Biron[17] gives the history of a case of gangrene of the lower extremity in typhoid fever. The patient was a girl, aged 21, and dry gangrene of the right foot set in at the end of a fortnight's illness, as the patient was beginning to convalesce. The cause of the gangrene was believed to be thrombosis due to arteritis. References to other cases of gangrene in enteric fever are given in the paper.

Acute dilatation of the stomach is a very rare complication of typhoid fever. The case reported by Cunningham Wilson,[18] of Birmingham, Ala., U.S.A., is of interest because perforation of the intestine was suspected. The patient was a woman, aged 22, who at about the end of the third week of her illness was seized with abdominal pain, tympany, and frequent vomiting. Upon laparotomy being performed, the abdominal cavity was found entirely filled with a distended stomach. "The lower portion of the stomach was tightly wedged in the pelvic cavity, and its upper border was high up in the epigastrium." A quantity of gas, bile-stained fluid, and mucus was removed by a stomach tube; after which the stomach resumed its normal size. It was washed out at the time and several times during the next few days. A considerable quantity of serous fluid was mopped up from the abdominal cavity. A quart of normal salt solution was poured in, and the abdomen sutured. The patient made a good recovery.

Diagnosis.—E. W. Goodall[19] has recorded some observations on the "ophthalmic reaction" obtained with typhoid endotoxin. This

reaction is similar to that of Calmette in tuberculosis. A 1 per cent aqueous solution of the endotoxin was used. The reaction was marked in five out of ten cases of typhoid fever in which it was tried, and in five it was slight. Whereas of ten cases of disease other than typhoid fever, in one case the reaction was very marked (a case of scarlet fever), in three (all cases of scarlet fever) it was slight, and in six (four cases of scarlet fever, one of indefinite pyrexia, and one normal person) there was no reaction. There was some reason for suspecting that the severe reaction in the scarlet fever case was due to some other cause than the endotoxin. In this case the height of the reaction was reached several days after the application of the solution to the conjunctiva, whereas in all the other positive cases the reaction was all over in twenty-four to thirty-six hours after the application. The reaction, therefore, could hardly be said to be diagnostic of typhoid fever, though it was in favour of it. (For the preparation of endotoxin, see below in Hewlett's paper on serum-treatment).

C. Floyd and W. W. Barker[20] have also tried Chantemesse's reaction, making use of the toxic principle of one billion bacilli to the cc. The reaction was positive in all but two of ninety-three cases of typhoid fever. In four of twenty-four cases which were not typhoid, the reaction was positive; all four were tuberculous cases. They state that, as a rule, the ophthalmic reaction precedes the appearance of agglutination and of the bacilli in the blood. A similar reaction can be obtained in *B. coli* infection with the toxin of *B. coli*; but only a very feeble reaction is given by the toxin of *B. coli* in *B. typhosus* infection.

The same two observers[21] have also made use of a cutaneous reaction, analogous to that of von Pirquet in tuberculosis. In order to prepare the test solution a highly virulent pure culture of typhoid bacilli was grown on agar for twenty-four hours at 37° C. The growth was then washed off with normal saline solution and the emulsion incubated for four days; at the end of this period it was sterilized in a water bath at 60° C. for half an hour and standardized by Wright's method. The sterile emulsion was then centrifuged and the clear supernatant fluid used for inoculation. But in some instances the centrifugalization was omitted and the whole emulsion used for inoculation. The test was applied as follows: After cleansing the arm with alcohol, a drop of the solution was transferred to it by means of a sterile platinum loop, and was then worked into the superficial layers of the skin by means of a platinum lancet. After the inoculated material had been allowed to dry, a second puncture was made below. The next day a red areola 0·5 to 1 cm. in diameter was to be observed round the point of inoculation. This reached its maximum in about twenty-four hours, when it began to diminish, and had usually disappeared in forty-eight hours. The test was applied in 47 cases; of these 30 were cases of typhoid fever. Of the typhoid cases, in 19 was the reaction positive, in 9 negative, and in 2 it was rendered unsatisfactory by the patient. Of the 17 non-typhoid patients, 2 were cases of

β-paratyphoid infection, 2 were cases of indeterminate fever, clinically, however, not differing from typhoid, 8 were cases of tuberculosis, 1 of pneumonia, 1 of acute rheumatism, 1 of pernicious anæmia, and 2 were normal persons. All of these 17 cases gave a negative reaction except one of the indeterminate fever cases and the pneumonia case; in the latter, the action was slight. The authors conclude that the value of the reaction in diagnosis is problematical, as the proportion of negative results in the typhoid cases is so high.

A. J. Brown,[22] New York, describes what he claims to be two new signs of importance in the early diagnosis of perforation. The first sign he calls the "dipping crackle" sign. To elicit this the bell of the stethoscope should be dipped suddenly over the right iliac fossa, when a very fine crackle will be heard, which sounds much like a fine, crepitant râle, or as if two sticky surfaces were being drawn apart. This sign was present in three of seven cases observed by Brown, who further states that he has never found the sign present over an area of more than two inches in diameter, and never later than four hours after the initial symptom. He supposes that the sound is due to the separation of the inflamed visceral and parietal peritoneum. The other sign was obtained in the case described by the author as follows: "The patient was examined immediately (after complaining of a sharp, excruciating pain in the end of the penis on micturition), and a small area of tenderness was found low down in the right iliac fossa. He was turned on his left side, and in half an hour the area of tenderness had moved that side about two inches." [Brown suggests that this procedure should be followed in every case. I confess I should be chary of moving a typhoid patient in this manner in suspected perforation; because I am afraid that, at any rate in the case of a perforation of any size, the intestinal contents may escape and be directed to other parts of the abdominal cavity; whereas one's object is to limit the infection of the peritoneum as much as possible.—E. W. G.]

Treatment.—At a meeting of the Medical Section of the Royal Society of Medicine on May 25th, 1909, R. Tanner Hewlett, E. W. Goodall, and R. M. Bruce[19] gave an account of forty cases which had been treated at three different hospitals with an **Anti-endotoxic Serum** prepared in the manner devised by the late Dr. Allan Macfadyen. It will be remembered that in this method pure cultures of typhoid bacilli are ground up in a specially constructed mortar at the temperature of liquid air, so that an opalescent fluid (typhoid plasma) results, containing typhoid endotoxin. This is injected into horses, and the blood-serum of these animals, after a course of injections, acquires an antitoxic power towards the endotoxin, and will in suitable doses protect guinea-pigs and other animals from the effects of the endotoxin and of typhoid bacilli. Six of the forty cases were treated with a serum that had been prepared by Macfadyen himself; it was of such a strength that 0·5 cc. of it saved the life of a guinea-pig injected intraperitoneally with fifteen lethal doses of typhoid culture six hours

previously. The remaining cases were treated with a serum prepared by Hewlett, which did not possess so strong a curative power as the first. Three of the cases died. In about sixteen there was reason for supposing that the serum did good. As regards the rest, little if any effect seems to have been produced. In three or four of the cases a speedy and unexpected termination of the case in recovery ensued, so that the opinion was expressed that the method was one of promise. The dose recommended is from 25 to 40 cc. given daily till some improvement is noted. It should be repeated if there is a recurrence of any of the symptoms of typhoid fever.

Three series of observations have been given recently, of cases of typhoid fever treated with **Typhoid Vaccine.** This method was first suggested by Sir A. E. Wright, not only as a result of his own researches in vaccine therapy, but also from the opinion that most likely the good results obtained by Prof. Chantemesse with a serum prepared by him were due to the presence in the serum of a typhoid vaccine in disguise. It is very important that, in any disease susceptible to treatment by vaccine therapy, the treatment should be begun before any serious tissue changes have taken place. According to Lt.-Col. Semple,[23] of Kasauli, " the conditions which obtain in a case of enteric fever are not favourable for the rapid production of protective substances, because the specific bacterial elements are being constantly introduced into the blood-stream, where they are killed off and diluted to such an extent that when they come in contact with the tissues which elaborate bacteriotropic substances a feeble response only can take place. In these circumstances a toxic effect may be the most prominent symptom, and as a matter of fact it often is, in many cases of enteric fever. When the same bacterial elements are introduced subcutaneously in the form of a vaccine and in appropriate doses, the toxic effects are a negligible quantity, and mainly localized to the vicinity of the inoculation." But protective substances are formed locally by the tissues in response to the direct contact of the bacterial elements, and these substances are absorbed into the circulating blood.

The general opinion is that the best vaccines are prepared from the organisms that are actually the cause of the illness, that is (in the present case) from typhoid bacilli obtained from the patient whom it is desired to treat (autogenous vaccines). Two of Semple's cases were treated by such a vaccine ; the remaining seven with a stock vaccine. The doses used by Semple were from 6 to 12 million bacilli, given once, or up to four times on successive days. In two cases 30 to 40 million were given at a dose ; and this author recommends 15 to 30 million daily. As probably the protective substances are formed locally, no two injections should be given at exactly the same place. The area chosen in these cases was the front of the chest, Opsonic estimations of the blood were carried out ; the opsonic index of the patients treated with the vaccine was raised. But it must not be forgotten that the opsonic content of the blood in enteric fever may vary from day to day in cases not treated with vaccine. If any

lowering of the index or any unpleasant constitutional effects occurs after an injection of the vaccine, an interval should be allowed, and another injection should not be given till the opsonic index becomes increased. In six of the nine cases treated by Semple with vaccine, "well-marked improvement set in after the inoculations. This was especially the case" in the patients "treated with autogenous vaccines." All the patients made excellent recoveries.

The second series of cases is that recorded by Capt. Smallman,[24] at Quetta. In all there were thirty-six cases, with three deaths, a fatality of 8·3 per cent, which is low for typhoid fever. The dose employed was 250 to 350 million bacilli, repeated once or twice; and there was an interval of several days between the first and second, and second and third doses. Smallman writes that "everyone who has been concerned in the care of these patients has been quite convinced that the injection of vaccine does produce an undoubted good effect." Usually there was a rise of temperature after the first injection; but this was followed by a fall, which lasted for some days. If the temperature then went up again, the vaccine was repeated. The charts given in Smallman's paper certainly appear to show that the vaccine has a favourable effect. It is, however, to be noted that the author states that "the charts of the thirty-six cases show that there is little evidence, so far, of appreciable shortening of the disease below the classical twenty-one days. On the other hand, the number of prolonged cases is small."

Smallman also gives an account of two cases in which typhoid vaccine was used locally for *periostitis of the tibia* following an attack of typhoid fever. One minim of the vaccine was injected deeply (to the bone) in the middle of the lesion. "In the first case . . . . the effect was almost startling. The injection was given at mid-day. At 6 p.m. the pain suddenly disappeared and did not return." In three days no trace of the periostitis could be found.

The third series has been recorded by W. H. Watters and C. A. Eaton,[25] of Boston. Thirty cases in all were treated with vaccine, with two deaths. The dose of vaccine was 25 to 50 million bacilli, repeated in most of the cases once or twice after intervals of three or four days. The authors are of the opinion that most of the cases were decidedly benefited by the treatment, and the temperature charts given (of all the cases) certainly justify their opinion. They speak, however, of their results with praiseworthy caution.

On the whole, from these three series of reports it would seem that the results of the vaccine treatment are very encouraging.

Sir W. B. Leishman[26] has published the results of **Antityphoid Inoculation** in the army up to June 1st, 1908. The total number of men inoculated was 5,473, amongst whom 21 cases (3·8 per 1000) and 2 deaths occurred. The number of non-inoculated was 6,610, with 187 cases (28·3 per 1000), with 26 deaths. The case-mortality of the inoculated was 9·5 per cent; of the non-inoculated, 13·8 per cent. Several of the regiments, however, were not exposed to the

chances of enteric fever, so that no cases occurred amongst either the inoculated or the non-inoculated. If these regiments are excluded, the incidence of enteric fever amongst the inoculated is 6·6 per 100°, and amongst the non-inoculated 39·5 per 1000.

Castellani[27] advocates the use of an antityphoid vaccine consisting of attenuated live cultures of the *Bacillus typhosus*, instead of killed cultures as in Wright's method. He points out that in the lower animals, such as rabbits, the use of dead cultures for immunizing purposes is less efficacious than the use of live cultures; and that it has been shown by Haffkine in cholera vaccination, and Strong and Kolle in plague vaccination in the human subject, that the degree of immunization obtained by employing avirulent live cultures is greater than that obtained by using dead cultures. Castellani prepares his live cultures in the following manner: "Tubes containing 10 cc. of broth are each inoculated with two loopfuls of a 48-hours-old culture of a typhoid strain which has been kept alive in the laboratory for three years, and is now avirulent. The broth tubes are kept in the incubator at 35° C. for twenty-four hours; they are then placed in a water-bath at a constant temperature of 50° C. for one hour, after which the vaccine is ready for use." He always uses the vaccine on the same day it has been prepared. That the bacilli are still alive can be shown by inoculating agar tubes. The inoculation of ½ to 1½ cc. of the live vaccine is followed by a local and general reaction, as in the case of dead vaccine; but in some cases the reaction is more marked. In about 20 per cent of the cases, agglutinins develop in the blood after a few days, whereas Castellani states that he has never himself seen any distinct production of agglutinins in man when using vaccines consisting of killed cultures. [This is not in accordance with the experience of most observers.—E. W. G.].

Castellani gives a brief summary of 416 persons inoculated with different kinds of antityphoid vaccine. In 106 cases two inoculations with dead vaccine were made; two of the persons contracted typhoid subsequently; in 90 cases both the inoculations were with live vaccine: none contracted typhoid; while in 220 the first inoculation was with dead and the second with live vaccine: none contracted typhoid. Typhoid fever is very common in Ceylon, where these inoculations were carried out. Castellani further suggests that mixed vaccination would be beneficial under certain conditions, that is, vaccination with cultures (dead or alive) of typhoid and dysentery; typhoid and paratyphoid; and typhoid, paratyphoid, and dysentery. The vaccines are prepared in much the same way as that for typhoid vaccine described above. If an animal is inoculated with two different bacteria at the same time, agglutinins and immune bodies for each of the diseases are developed in the blood. Castellani recommends for prophylaxis against typhoid fever the inoculation of ½ cc. of dead culture prepared according to Wright's method, followed in a week's time by the inoculation of 1 cc. of live culture prepared according to his own.

It has been objected to the use of live cultures for vaccination purposes, that the reaction would be very severe, and that the person inoculated might become a "carrier." But Castellani, from observations on himself and fifteen laboratory attendants, concludes that the reaction is not severe, and the person subjected to the treatment does not become a "carrier."

J. P. Roark,[28] of Bushnell, Ill., U.S.A., advocates a method of treatment which he apparently believes to be new, though it is really only a modification of the application of the **Wet Pack.** After a dose of calomel followed by a saline purge, "the baths are instituted at once without reference to the patient's temperature. The bath is first given at 7 a.m., and repeated regularly every two hours during the day till 9 p.m., unless the patient is restless, when the last bath is given at 11 p.m. Immediately preceding each bath the patient is required to drink four to eight ounces of water, and immediately after each bath he is required to sip slowly from two to six ounces of milk, the amount depending largely on the appetite of the patient.

"*Technique of the Bath.*—One-half of the bed is covered with any material (an ordinary quilt, folded once, answers the purpose perfectly), the patient's nightgown is removed, and he is moved on to the covered portion of the bed. Two large bath-towels are then saturated in a bowl of water of the required temperature; the patient is told to extend the arms parallel with the body, and the anterior surface of the body is covered with the towels that have been slightly squeezed—not wrung—when taken from the water. The towels are allowed to remain for three minutes; they are then removed, re-wetted, and the process is repeated on the posterior surface of the body. The patient's body should be entirely covered from head to heel, the towels overlapping somewhat in the middle of the body. The whole process, including time spent in giving water before the bath and milk afterward, should occupy about twelve minutes. If the patient complains of chilliness following the bath, he may have a hot-water bottle and some extra cover for fifteen or twenty minutes; and if the chilliness is not relieved in this time, it is best to raise the temperature of the water used in the bath. The temperature of the bath for a robust adult should be about 60° F., and for most women and all children from 20 to 30 degrees higher. [According to Roark the only contraindication is intestinal hæmorrhage. But surely signs of perforation would also be regarded as contraindicating this form of treatment?] —E. W. G.]

The author claims for this method better results than for any other form of treatment; he states that during eleven years he has treated ninety-seven cases of typhoid in this manner without any deaths. But unfortunately he gives no details as to the nature of the cases (severity, age, etc.). It is quite a misnomer to term the method the "bath treatment," as the author does. As I have said, it is a modification of the wet pack. The author does not seem to have had any experience of the bath treatment, either that form introduced by Brand, or

Hare's modification. And he certainly is in opposition to nearly all, if not all, the authorities, when he states that "the Brand method . . . . does not, I believe, materially lower the mortality-rate." The author is of opinion that his treatment eliminates the toxins, and that this elimination "takes place through the skin." But he does not advance a shred of evidence that that is the case. As a form of treatment in cases where there are no facilities for bathing, the wet-pack is no doubt of very great benefit, and the method advocated in this paper will be found useful, even though we do not anticipate the invariably good results obtained by the author, and certainly have no faith in his pathological explanation.

Lieut. F. A. Barker, I.M.S.,[29] gives a brief account of two cases of severe typhoid fever in which, when the temperature was between 104° and 105° F., thirty minims of **Creosote** were rubbed into the patient's flanks at about 5 p.m. Very soon each patient began to perspire vigorously, and within two hours the temperature fell to subnormal, without any collapse. The effect, however, was of very short duration, for in a few hours the temperature was as high as before. In neither of the patients did sponging or packs have any marked effect. Both recovered.

Such treatment might prove useful where a high temperature did not yield to the ordinary methods. The same may be said of the intravenous injection of 1 cgram of **Sublimate** advocated by Crispolti.[30] Two cases were treated, the one with two and the other with three injections. A fall of temperature, not permanent, appears to have followed each injection.

S. Strouse,[31] of Baltimore, reviews the recent change of opinion on the question of the **Diet** in typhoid fever, and relates two years' experience of a more liberal diet as observed in the wards of the Johns Hopkins Hospital. He points out that with a purely milk diet, as ordinarily practised, there is a loss in the patient's weight of 200 to 600 grams daily (7 to 20 oz.), made up of water, fat, and proteins. Experiments have shown that a more liberal supply of nitrogen-containing food will reduce the loss to a minimum. Further, "a normal resting individual weighing 70 kilos. (150 lb.) and receiving sufficient food, expends about 33 calories per kilo. of body-weight per day, or a total of 2300 calories. In fever there is approximately an increased heat production of 25 per cent, which, added to the 2300 calories, makes 2800 calories. If a fever patient does not have this amount of energy supplied in his food, he will burn up his own tissues to supply the deficit. If he receives 1500 to 2000 cc. of milk per day, as in ordinary milk diet, he receives about 1000 to 1400 calories only. The liquid diet, of which milk is always the main constituent, has about the same caloric value. If all typhoid subjects were to get 3 to 4 litres of milk daily, the problem of typhoid fever feeding would be simple, but for many obvious reasons this is impossible, and we must look for additional food to supply the deficiency." The author then gives the statistics of two series of cases, one fed on the liquid diet

(149 cases), the other on a liberal diet (98 cases). The liberal diet consisted of milk, broth, soft eggs, soft toast, thin gruel, custard, junket, and jelly. These were allowed during the febrile stage. The patients on liquid diet received milk and albumen-water; about half of them had also broth.

The numbers in the two series are few; but they are in favour of the more liberal diet as regards death-rate, the incidence of complications, and the length of the illness. Relapses, however, were more frequent in the series of liberally-fed patients. Of course, as the author points out, there will also be a certain number of cases who become too ill to take anything more than milk and water, or perhaps only albumen-water, for several days; but the author confirms the opinion of other physicians of recent years, that most cases of typhoid fever can with advantage be allowed more than a purely milk diet.

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ULCERS. *E. Graham Little, M.D., F.R.C.P.*

Barr[1] has found the following modification of Unna's gelatine method of treating ulcers of the leg useful:—

R	Charcoal	18 parts	Gelatin		16 parts
	Ferric Oxide	6 parts	Glycerin		20 parts
	Boric Acid	6 parts	Water		50 parts

Soak gelatine and portion of glycerin and water for twelve hours; make paste with remainder. Mix together and heat on water bath, stirring; pour into shallow vessel. A carbolic-resin bandage is wound tightly round the leg, covering the ulcer and for a hand-breadth above and below; the mixture is then painted over the site of the ulcer, and the whole bandaged over with an ordinary bandage. The ulcer should be first cleaned with boric fomentation or with red lotion. The paste is left on for a week at first. When the ulcer is healing well, the parts may be left for a fortnight.

Simpson[2] recommends, from long personal experience, the following method of treatment for chronic varicose ulcers. If the patient can be kept in bed, this is advised, and the ulcer is dressed with hot fomentations; if this is not possible, the ulcer is packed overnight with lint saturated with vaseline, kept in position for twenty-four hours, when the leg is placed in a hot-water bath and also mopped

with absorbent cotton, either plain or with some antiseptic, e.g., hydrogen peroxide (3 per cent), potassium permanganate (4–1000), or bichloride of mercury (1–1000). Redundant granulations are curetted away, a second application of oil-lint made, and the surface dusted with iodoform, aristol, or ichthyol. The wound should now be converted into a clean ulcer, which must henceforth be kept dry by means of powder—talc, to which may be added acetanilide (antifibrin). A pad of six or more layers of sterile gauze is kept *in situ* by a bandage applied closely from the foot to the knee. The dressing should be retained for three days, and then reapplied in the same way. After healing, an elastic stocking should be worn over a thin stocking to protect the skin.

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URACHUS, CYSTS OF THE.

John B. Deaver, M.D., LL.D.
Astley P. C. Ashhurst, M.D. } *Philadelphia.*

A. H. G. Doran[1] has recently operated on a second case of this kind, his first having been reported ten years ago. He urges that the pathological conditions of the urachus of surgical interest be studied under the following headings: (1) Fistulæ; (2) Primary cystic fistulæ communicating from the first with the bladder, or opening at the umbilicus; (3) Pure urachal cysts; (4) Secondary cystic fistulæ, developed from pure cysts which have acquired communications with the bladder or umbilicus. His own paper deals solely with urachal cysts. Our knowledge of the anatomy of the urachus is based almost entirely on the studies of Wutz, supplemented by recent investigations of Binnie and Clendenning.

Mr. Doran calls particular attention to the possible existence of a meso-urachus, which may permit these cysts to become, partly at least, intraperitoneal. This meso-urachus is not, he holds, acquired by the growth of the cyst, but must have existed even during fœtal life. The existence of a valvular structure (Wutz's valve) at the dome of the bladder, in cases of partially patent urachus, is also discussed; this valve may prevent ascending infection of cystic urachal fistulæ communicating with the bladder. The error committed by Lawson Tait and others of mistaking cases of encysted peritonitis (tuberculous), or of migrated dermoids, for true urachal cysts, should be guarded against.

Doran then details the histories of cases of urachal cysts reported since his former paper 10 years ago. A number of these were found at operation, a correct diagnosis seldom being made before the abdomen is opened. The cysts simulate appendicular abscess, omental cysts or solid tumours, tuberculous peritonitis, etc.; the diagnosis at operation is based on the connection of the cysts by a pedicle with the dome of the bladder, and on its largely extraperitoneal situation, though not always exactly in the median line; this diagnosis may be confirmed by microscopical examination of the cyst walls,

which may show transitional epithelium like that of the bladder. Total excision of the cyst is not always possible : the frequent occurrence of attacks of pelvic peritonitis may have rendered the intestines so adherent that only the anterior wall of the cyst may be removable. Moreover, the insertion of the ureters may be abnormally high in these cases. As much as possible of the cyst wall should be removed, and the inner lining of the remainder dissected off from the parietal peritoneum as far as this can be done without injuring adherent structures. In one case (Eve) a portion of intestine was excised. The remaining portions of the cyst wall should then be approximated by sutures, obliterating the cavity, and the abdominal wound should be closed with drainage, except where the cyst wall is completely removed. Careful attention must be given to the vesical end of the cyst, lest fistula from the bladder be overlooked.

Reference.—[1]*Lancet*, May 8, 1909.

URETER, DISEASES OF. *E. Hurry Fenwick, F.R.C.S.*

Stone in the Ureter.—Moschcowitz[1] makes several good points in recording his experience of ureteric calculi. He has been struck with the fact that in 16 out of 18 of his cases he has found the calculus impacted at a point between the vesical end of the ureter and the point where it crosses the common iliac artery, perhaps a trifle nearer to the former. He has also found this point of constriction of the ureter not to be due to any internal narrowing, but to a dense, sharp, fascial band (sometimes containing a small blood-vessel), which passed horizontally inward from the lateral pelvic wall to the median line. In his experience it is always necessary to divide this band of fascia, in order to mobilize the lowermost segment of the ureter. The constant presence of this band leads him to the belief that the impaction of calculi in this portion of the ureter is not wholly due to the slight change in direction which the ureter takes in this part of its course. Neither, as it occurs in both male and female sex, can the broad ligament and uterine artery be looked upon as factors in its production.

He cannot recall a case of renal or ureteral calculus in which red blood-cells were not found on careful microscopy. He states that it is a peculiar physiological phenomenon that when a ureter is the seat of a calculus, the tenderness is not limited to the site of the calculus, but to the entire extent of the ureter. He believes this generalized tenderness is due in a greater or less degree to associated inflammation of the mucous membrane, and to tension caused by a retardation in the urinary flow. Moschcowitz remarks that occasionally a ureteral catheter may pass easily even if a calculus is present, especially if it be small or irregular in shape. He rightly regards the X-ray as the most important diagnostic method, and relies upon it absolutely.

Operative or Expectant Treatment.—It may be conceded at once, that every case is a law to itself ; that it is well-nigh impossible to frame rigid laws of interference or non-interference in descending

stone ; and yet the ventilation of so difficult a question has its advantages, and Lester Leonard[2] asks, Can the indications for and against operation in ureteral lithiasis be determined with sufficient accuracy by known methods of diagnosis, to justify non-operative, i.e., expectant treatment in a well-defined group of cases ? He concludes that expectant treatment (that is, medical measures) under careful medical supervision, with frequent analysis of the urine, is wiser in the majority of cases (two to one). Such treatment is based on the data derived from a careful Röntgen-ray examination, with a study of the symptoms and signs as shown by other clinical methods. The results show that in 50 per cent of the cases of urinary lithiasis presenting marked symptoms, natural forces are capable of expelling the calculus. The indications on which rational expectant treatment can be based, after Röntgen-ray examination has determined the position and size of a small ureteral calculus, are derived from a careful clinical history, direct physical examination, and chemical and microscopic analyses of the urine. The importance of a complete and carefully taken clinical history cannot be overestimated. From it can be deduced the amount of power present to expel the calculus and the chances of its final accomplishment. In favourable cases, the history shows a succession of attacks of acute ureteral colic, increasing in frequency. They mark the steps in the progress of the calculus down the ureter. The pain is most acute during the attacks, and is localized at the seat of the calculus. Between the attacks there is a constant lumbar ache, as the urine is banked up in the pelvis of the kidney, increasing in intensity just before the acute attack of colic. These symptoms show that there is sufficient vitality in the kidney, and a *vis a tergo* essential to the final expulsion of the calculus.

Chemical and microscopic analyses of the urine, repeated at frequent intervals, are absolutely essential to justifiable expectant treatment. The presence of pus or blood is not an indication for operation, if the calculus is small and no hyperpyrexia is present. Albumin is the most constant sign in urinary lithiasis, and is not an important factor when present in a moderate amount. The estimation of the total amount of urea excreted, determines the functional efficiency of the kidneys, and so long as it remains normal, it shows that no undue strain is placed on them.

The indications for expectant treatment in cases in which a small calculus has been detected by the Röntgen-ray method are, a history of repeated attacks of colic, increasing in frequency, with a constant lumbar ache, a urine free from any excess of morphologic elements and having a normal amount of urea, and these combined with an absence of febrile symptoms. The contraindications are a calculus in the kidney, or one in the ureter that is too large to pass, a marked amount of pus in the urine, with high fever, or a persistent unilateral anuria without symptoms.

The adjuvant treatment employed is to relieve pain, to relax spasm,

to prevent the formation of more crystalline débris, and to hasten the expulsion of the calculus. The relief of pain in the acute attacks of colic must sometimes be accomplished by large doses of **Morphia**, or even general anæsthesia to the point of relaxation. **Atropine** should always be given in conjunction, as its effect in relaxing the spasm of the involuntary muscular fibres is of great value, not only in relieving pain, but also in facilitating the passage of the calculus. The application of **Moist Heat** externally is often effective in severe attacks, and the avoidance of morphine is desirable, as in a measure it hinders the onward progress of the calculus. In ureteral colic of the left side, moist heat can be effectively employed by high enemas of water as hot as can be borne. The flushing action of large quantities of water is an effective agent in the progress of the calculus, and is probably the chief value of the mineral waters frequently advocated. There seems little reason to believe that any solvent action is obtained from the remedies often advanced for this purpose. In some cases they have a decided influence in preventing the formation of crystalline débris, but it is difficult to say how much of this is the result of their diluent properties. It is hardly reasonable to expect that agents which do not dissolve a calculus when they are concentrated in a test-tube, will produce such an action in the dilute form in which they must of necessity pass through the kidney. The formation of fresh precipitates, apparently can be prevented by largely diluting the urine and changing its reaction. For this reason, the natural alkaline waters are valuable when the fresh urine has an acid reaction. When phosphatic salts predominate, the best diluent is buttermilk, which contains lactic acid. Although its administration has never been shown to dissolve even a small calculus, its employment has prevented the formation of vesical calculi in cases in which repeated lithotrities had failed. Diluents seem valuable in proportion to the amount absorbed rather than to any chemical constituent. Urotropine (hexamethylenamin) is valuable as a urinary antiseptic in cases of mild infection, but should not be depended on to replace operation when grave infection and hyperpyrexia are present.

Ureteral Stone or Appendicitis?—It is now a matter of common knowledge, though perhaps the fact is not sufficiently appreciated, that there is a great similarity in the symptoms of appendicitis and those due to impacted ureteral stone. If the golden rule of careful microscopy of the urine in all cases of relapsing appendicitis is carried out, a faulty diagnosis will be less often made, for in ureteral stone blood-cells are nearly always present, and this serves to distinguish the disease from appendicular trouble. Both the practitioner and surgeon must, however, keep an open mind as to the possibility of both diseases occurring coincidently—descending stone and appendicitis.

Danger of Drainage after Uretero-lithotomy.—Moschcowitz has removed a calculus from either ureter (the juxta-vesical section) by the ordinary incision. Seven days later, on removing the drain tubes, there was tremendous hæmorrhage from the wounds, and it was found that both

external iliac arteries had sloughed from pressure of the drain-tube. Both were ligatured, and in spite of the enormity of the accident, the patient made an absolutely uneventful recovery, and was discharged cured. Woolsey[3] has also an objection to drain tubes after ureterolithotomy. In one case, having a history of a progressive or pernicious anæmia for eighteen months, he replaced the cigarette or rubber-tissue drain by a rubber tube on the sixth day after operation. This was removed six days later, because there was considerable oozing of blood through the tube, and several clots were passed through the urethra with considerable pain. The patient did well until five days later, when there was a fresh hæmorrhage from the sinus and into the bladder, and he died the same day.

Uretero-vesical Implantation.—The implantation of a ureter into the bladder when the former has been damaged during an operation, e.g., hysterectomy, has always been a grave surgical difficulty. R. L. Payne[4] devised a method of stitching the stump which promised to render the union more secure, and more effective in allowing the ureter

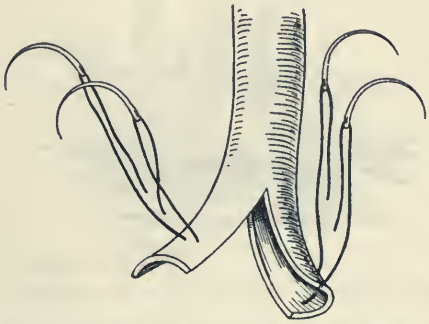

Fig. 103.—Ureter split and traction sutures passed.

to perform its subsequent duty. After the stump of the ureter has been localized and freed extraperitoneally, Payne strips the peritoneum backward from the bladder, loosens the bladder from its attachments on either side, and with the aid of a sound passed through the urethra into the bladder by an assistant, pulls the organ to the left, if the damaged ureter be on the left, and upward, thus elongating it into a diverticulum effect. The bladder is then fixed in this shape, and sewed with catgut to the pelvic fascia both above and below the external iliac artery. This elongation upward of the bladder permits a good approximation of the shortened ureter. The kidney is then lowered, if necessary, so as to still further permit approximation. The actual anastomosis is made as follows : The end of the ureter is split upon two sides (*Fig.* 103) thus forming separate flaps, and when these are drawn down into the bladder by traction sutures and fixed on each side of the vesical incision, there is a resulting ureteral opening which is larger than the calibre of the tube, and around which there are no sutures or united mucous margins to undergo cicatrization

and subsequent contraction. A glance at *Fig.* 104 will serve to show how the sutures are passed.

Witzel was the first to elongate the bladder for a shortened ureter. Several years ago Bovee successfully lowered the kidney in a dog, for a shortened ureter. Payne's case is the first instance in which the procedure has been carried out on a human being. Of all the various plastic procedures for the relief of ureteral fistula, ureterovesical implantation is undoubtedly the best, for it re-establishes a natural state of things, cures the fistula, and above all else conserves the kidney. The objections to vesical grafting in cases of ureteral fistula have been, that it could be applied only to those cases in which the injury is very close to the bladder; for a ureter severed at the base of the broad ligament, behind the uterus, or higher up, would not permit of the renal stump approximation with the bladder. It is true that the ureter is very elastic, and hence amenable to much stretching, but traction largely reduces the possibilities of anastomotic union,

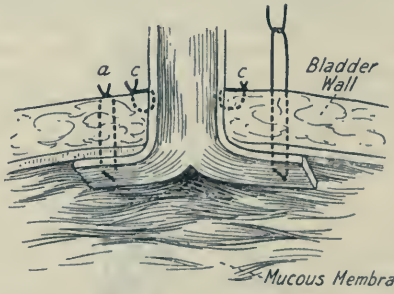

Fig. 104.—Split ureter passed through vesical incision. (*a*) Traction suture tied. (*c*) Vesico-ureteral sutures tied.

and at the same time tends to lessen the lumen of the duct, and thus contributes a factor in the induction of hydronephrosis, the greatest danger of ureteral anastomoses. This source of danger can be overcome by lowering the kidney, as was practised in Payne's case.

Ureterostomy.—In the last issue of the *Annual* attention was directed to the occasional value of draining away the urine through a bilateral ureterostomy on to the loin or front of abdomen in advanced cancer of the bladder and prostate, or as a preliminary step to removing the bladder in redundant and uncontrollable villous papilloma or advanced tubercle. The chief danger lies in stenosis of the orifice by cicatricial contraction. Hurry Fenwick now uses an incision similar to that employed for tying the common iliac artery, and seizes the opportunity of tying the superior and middle vesical arteries on both sides, before attaching the stumps of the ureters to the skin, on the same principle that one ties the linguals before removal of the tongue. The anteriorly placed fistulous orifice is more easily cleaned and dressed than when situated in the loin. (*See* BLADDER, DISEASES OF.)

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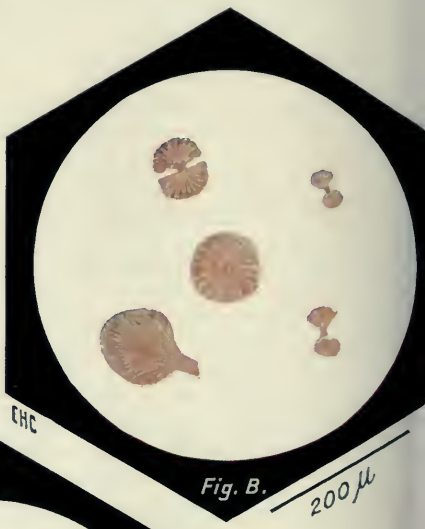
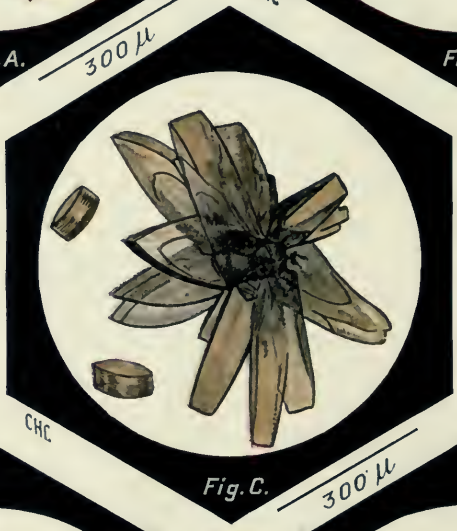
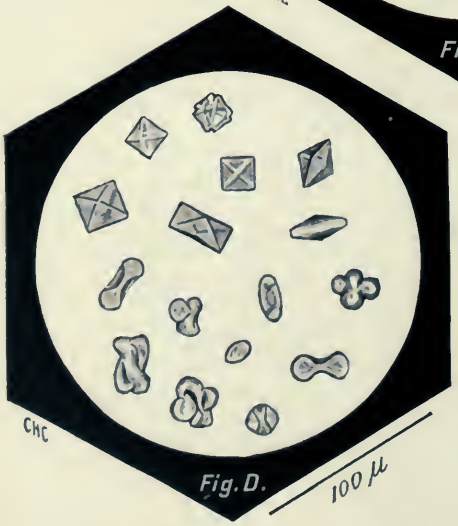






URINARY DEPOSITS

URINARY DEPOSITS. *Francis D. Boyd. M.D.*

Urinary sediments may frequently be recognized by their physical and chemical characteristics without any microscopic examination, but in most cases the microscope is invaluable, and in the case of organised sediments absolutely necessary for differentiation. If a deposit be abundant at the foot of the urine-glass, a portion can be readily taken up with a pipette, run on to a slide, a cover slip placed in position, and the preparation examined under the microscope. If the deposit is scanty, it may be necessary to centrifuge the urine to obtain a preparation for examination. No examination of the urine for tube casts, tubercle bacilli, etc., can, when negative, be considered complete unless the centrifuge be employed. At times, in examining urine for tube casts and cells, difficulty will be met from the presence of a copious deposit of urates, phosphates, or carbonates. Urates may be got rid of by warming the urine and diluting with sufficient water to hold the urates in solution on cooling, or if this is not possible the urine may be rendered alkaline with caustic potash solution or with borax. Phosphates or carbonates can be got rid of by acidulating with hydrochloric acid.

[The illustrations to this article have been drawn direct from clinical specimens by Mr. C. H. Collings, of the Laboratory, Thayer Street, London, W., who has taken great pains to secure that the varied appearances, which the same deposit may present in the microscopic field shall be represented: we think that they will be valued as a permanent source of reference by our readers.—Ed. M. A.]

Plate XLVIII.

Uric Acid.—Crystals of uric acid (*Figs. A* and *C*) occur in an acid urine, alone or accompanied by amorphous urates. The fine, shining, sparkling crystals are, as a rule, of a red-brown colour, and may be recognizable by the naked eye. The colour is due to the pigment uroerythrin. The microscope shows rhombic crystals of various forms, lozenge- or oval-shaped plates, spikes, and rods. The rods are often grouped together in stellate or rose-shaped collections, sheaf-like or fan-shaped bodies. In case of any doubt as to the nature of the deposit, the murexid test may be applied. The deposit is collected and treated with dilute nitric acid upon a porcelain dish or plate. Solution takes place with effervescence. After evaporation there remains a reddish residue, which turns a beautiful purple-red on the addition of ammonia, due to the formation of ammonium purpurate (murexid). The addition of caustic potash solution will change the colour to violet. Urates also react to the murexid test.

Clinical significance.—Uric acid is precipitated in the urine by a double rearrangement between acid sodium phosphate and neutral urates held in solution. It may be found along with amorphous urates in concentrated urine. Rapid precipitation of purely crystalline uric acid without amorphous urates in a fairly abundant urine shows that the urine is highly acid. *The precipitation of uric acid in the urine has nothing to do with the so-called uric acid diathesis.*

Sodium Urate from Acid Urine.—With the exception of ammonium urate, urates (*Fig. B*) appear only in acid urine. The deposit occurs as a clay-coloured, reddish-yellow, brick-red, or rose-red sediment, often adhering to the glass. It dissolves readily on heating, or on the addition of an acid. Ordinary urate sediments consist of a mixture of sodium, potassium, calcium, magnesium, and ammonium urate, sodium urate predominating. Under the microscope the deposit is as a rule amorphous, but may take the dumb-bell or fan-shaped crystalline form seen in the plate.

Clinical significance.—Urates are thrown out of solution by the same double rearrangement which gives rise to the precipitation of uric acid. Their precipitation is favoured by the cooling of the urine. Urates are found when the urine is concentrated, scanty, and highly acid, as in febrile diseases, passive renal congestion, and in the urine of healthy individuals after severe physical exercise or after the ingestion of large quantities of animal food.

Calcium Oxalate (*Fig. D*) occurs as a sparse light deposit. Most frequently the crystals are entangled as glistening specks in the mucous cloud. Under the microscope the crystals usually appear as octahedra—two irregular four-sided prisms placed base to base—the *envelope forms* seen in the upper part of the figure. Less frequently the crystals occur as discs constricted across the short axis to form a dumb-bell-like figure. The crystals are found as a rule in faintly acid or faintly alkaline urine. They are unaffected by acetic acid or weak alkalies, but dissolve if treated with hydrochloric acid.

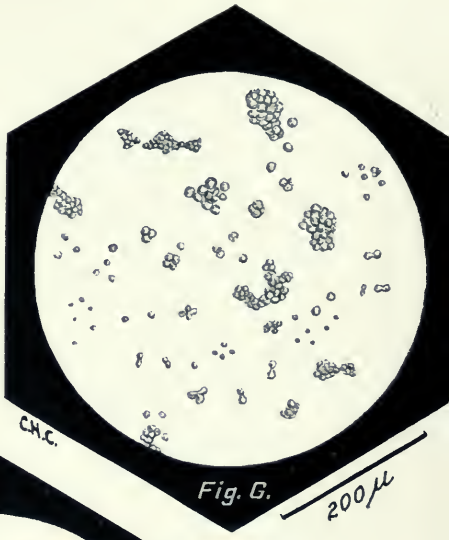
Clinical significance.—The crystals occur in both normal and pathologic urine. They may be present after the ingestion of foodstuffs rich in oxalic acid, e.g., tomatoes, rhubarb, etc. Sometimes they are present in diabetes mellitus. They are present in the clinical condition known as " oxaluria," when their presence is coincident with dyspeptic and nervous disorders. The deposition of oxalate crystals *does not necessarily* indicate increased oxalic acid secretion.

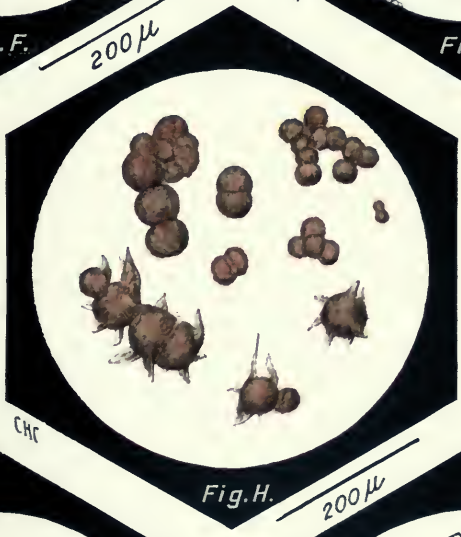
Cystin (*Fig. E*) is an uncommon urinary deposit, and forms a rare constituent of urinary calculi. Under the microscope, cystin appears usually in the form of hexagonal plates, often superimposed upon each other. Uric acid, under exceptional circumstances, takes a similar form. To differentiate, add to the deposit solution of ammonia: cystin will be dissolved. Filter, and allow the ammonia to evaporate by exposure to the air, and cystin will be again deposited. Uric acid is only slightly soluble in ammonia.

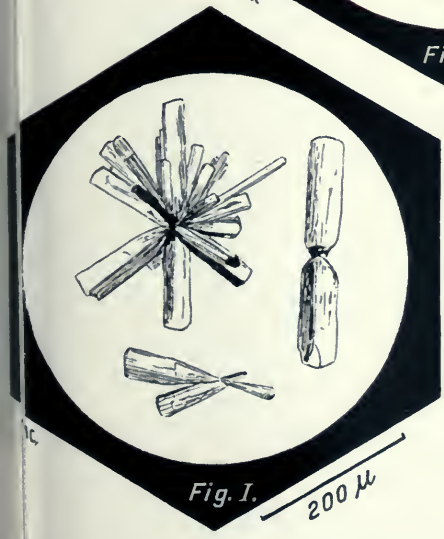
Clinical significance.—The occurrence of cystinuria is a peculiar metabolic phenomena which is not fully understood. Cystin separates from an acid urine within the urinary passages.

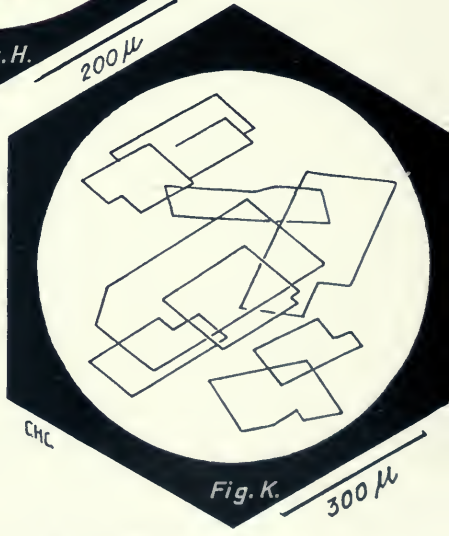
Plate XLIX.

Phosphates are deposited in the urine as a white flocculent precipitate which is soluble on the addition of a weak mineral acid or acetic acid. *Fig. F* shows ammonio-magnesium phosphate, triple phosphate, in









URINARY DEPOSITS—*continued*

characteristic " coffin-lid " crystals, large prisms with oblique ends. They are often accompanied by ammonium urate. More rarely the salts deposit in quadripartite feathery forms like the frost flower.

Clinical significance.—Triple phosphates occur in alkaline urine when the alkalinity is due in whole or in part to the formation of ammonium carbonate from urea, under the influence of micro-organisms. This bacterial action may occur in the urinary passages or after the urine has been voided. The crystals may occur in an amphoteric or faintly acid urine, if fermentation has begun.

Dicalcium Phosphate (neutral calcium phosphate or simple acid calcium phosphate) (*Fig. I*) is a somewhat rare deposit which occurs in light-coloured, faintly acid, or amphoteric urine. The crystals are usually wedge-shaped or pointed at one end. They occur either singly or arranged in rosette-like groups, the points of the crystals being directed towards the centre. The crystals are usually associated with amorphous phosphates.

Calcium Carbonate (*Fig. G*) may occur in urine which has an alkaline reaction, especially after the ingestion of large quantities of vegetable foods. The salt is amorphous or crystalline, in globules or masses of globules, or imperfect dumb-bell forms. On treatment with an acid it readily dissolves with the effervescence of carbonic acid gas. Before applying this test, the sediment should be washed with water to free it from soluble carbonates, especially ammonium carbonate, which effervesces on the addition of an acid.

Clinical significance.—Calcium carbonate is a common crystalline deposit in the urine of herbivorous animals, but in human urine it is usually amorphous or in globules. Normal and basic phosphates, carbonate of calcium, and amorphous magnesium carbonate may occur in any alkaline urine, particularly if the alkalinity is due to a fixed alkali, as after the ingestion of vegetable food. The salts are also precipitated if the urine is artificially rendered alkaline. If a faintly acid, neutral, or faintly alkaline urine is boiled, the acid combinations in which the salts are in solution in the urine are changed to basic combinations, and precipitation may take place. On the addition of an acid, this turbidity disappears.

A deposit of amorphous phosphates and carbonates in the urine is evidence of diminished urinary acidity, which may result from the ingestion of alkalies, alkaline salts of the vegetable acids, or the resorption of inflammatory fluids or blood. Diminution of urinary acidity may also follow vomiting, gastric lavage, and digestive disturbance, such as excessive secretion of hydrochloric acid (hyperchlorhydria), accompanied by motor insufficiency.

Ammonium Urate.—In alkaline urine from fermentation, urates may be deposited as a crystalline ammonia salt (*Fig H*). The crystals are large globules or aggregates of globules, mostly dark yellow in colour and often coated with minute pointed crystals (hedgehog crystals). They are readily soluble in acetic acid. If treated with

caustic potash solution, bubbles of ammonia may be evolved. These reactions readily distinguish the spheroidal forms from leucin.

Clinical significance.—Alkaline fermentation.

Cholesterin is sometimes deposited in the urine in disease of the urinary tract, such as inflammation of the bladder, pyelitis, nephritis, chyluria, etc. It occurs as rhombic plates with notches at their angles (*Fig. K*).

Plate L.

Epithelium.—Isolated epithelial cells, chiefly of the squamous type, are met with in most specimens of healthy urine, but when in large quantity they indicate the presence of some morbid process. It is frequently possible to determine the place of origin of the cells from their form, yet isolated cells coming from different regions occasionally resemble each other so closely that it may be impossible to determine their place of origin with any certainty.

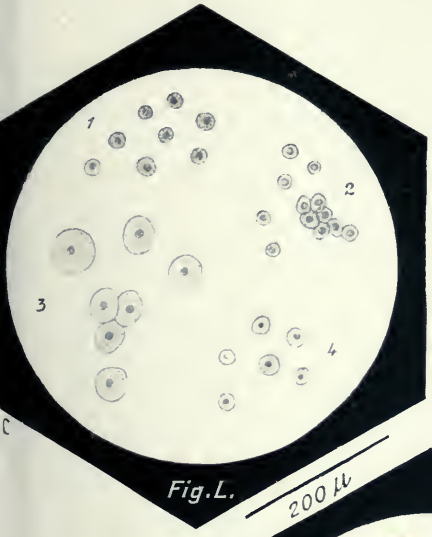
Renal Epithelium (*Fig. L*) appears as spherical or cubical cells a little larger than a white blood corpuscle, and only distinguishable by the possession of large well-defined single nuclei. At times, particularly in nephritis, they show evidence of fatty degeneration. These cells are very uncommon in healthy urine, but very plentiful in some forms of nephritis.

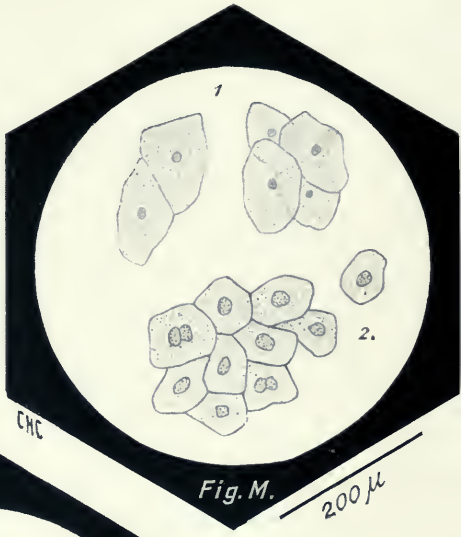
Other forms of rounded epithelial cells with a single nucleus, and varying in size, may be met with from the deep layer of the pelvis of the kidney, from the neck of the bladder, and from the urethra.

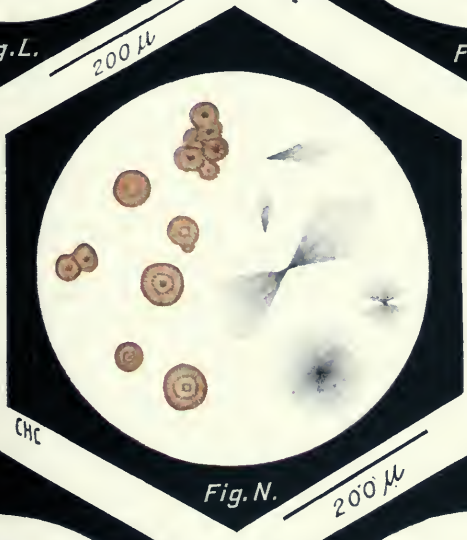
Squamous Epithelium (*Fig. M*) may be (1) from the vagina, or (2) from the bladder. Vaginal epithelium is frequently shed in the form of shreds composed of a number of cells. The cells are irregularly polygonal in outline, the protoplasm is transparent and finely granular, and contains a single nucleus, placed nearly centrally, and oval or round in outline. This nucleus is absolutely and relatively smaller than the nucleus of flat cells from the bladder. Vesical squamous epithelium occurs frequently in isolated cells varying in size; the protoplasm is usually cloudy, and the nucleus may be double.

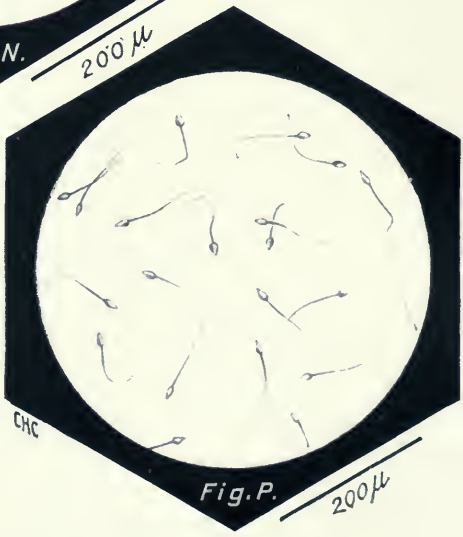
Columnar or Caudal Epithelium (*Fig. O*) (1) Superficial pelvis; (2) Ureter; (3) Bladder; (4) Urethra—occurring as cells with prolongations varying in size, was at one time considered invariably to come from the pelvis of the kidney. Unfortunately for the differentiation of pyelitis and cystitis this is not correct, but it may be said that a pronounced predominance of caudal epithelium suggests pyelitis rather than cystitis.

Leucin and Tyrosin (*Fig. N*) do not occur in the urine under normal conditions. They are products of the decomposition of protein, and their presence always indicates very considerable disturbance of metabolism. Tyrosin being but slightly soluble, separates out readily, but leucin being more soluble, may only separate after evaporation. As a rule, if these bodies be present, the slow evaporation of a drop or two of urine on a slide is sufficient for their demonstration. Tyrosin crystallizes in the form of fine silky needles, which are either colourless,









URINARY DEPOSITS—*continued*

as in the plate, or of a yellowish or brownish colour. The crystals are generally arranged in a radiating fashion in the form of sheaves, rosettes, or tufts. Leucin crystallizes as faintly glistening spheroidal bodies, with concentric markings interrupting a radiating striation. The sphenoids vary in size.

Clinical significance.—Leucin and tyrosin are met with in cases of acute yellow atrophy of the liver, and in phosphorus poisoning. They occasionally occur in profound disorders of metabolism such as typhoid fever, small-pox, and diseases of the blood such as pernicious anæmia and leukæmia.

Spermatozoa (*Fig. P*) are found in the urine of man for some time after the occurrence of coitus or masturbation. They appear in large numbers in the urine in spermatorrhœa. They occasionally occur after epileptic or other spasmodic seizures, and in severe illnesses, e.g., typhoid fever. If viewed shortly after the urine is voided, they may exhibit undulating motion, but this is soon lost, especially in an alkaline urine. They are easily recognized by their characteristic form—elongated structures possessing a head, neck, and tail. The head is pear-shaped, and narrow anteriorly.

Plates LI and LII.

Renal Tube Casts are microscopic formations of cylindrical form, which have their origin in the renal tubules. They are usually associated with albuminuria, but may occur when no albumin can be found, and may be absent when albumin is present. They most commonly occur in the different forms of nephritis but the hyaline variety are sometimes found in the urine of healthy persons after severe exertion.

Hyaline Casts.—*Figs. V* and *Y* are straight or convoluted,colourless, homogenous, diaphanous bodies, slightly striated or dotted from the presence of detritus or fat. Their length and breadth vary. In bile-stained urine they have a yellow or yellowish-green colour. They are not infrequently covered by cells and the products of cell disintegration, as well as by non-organized constituents, e.g., oxalates and urates. (*Fig. Y* shows a cast with calcium oxalate adherent.)

Hyaline casts are found in the urine in cases of renal ischæmia and hyperæmia in diffuse nephritis, but especially in chronic interstitial nephritis.

Cylindroids (*Fig. W*) are long, pale, delicate, ribbon-like bodies, consisting of mucus, showing fine longitudinal striation; they may resemble hyaline casts, but unlike the genuine cast, they are not soluble in acetic acid. They are of no special diagnostic significance, and may occur in normal urine or as the result of any inflammatory affection of the mucous membrane of the urinary tract.

Granular Casts (*Fig. Q*) are found in the urine in cases of acute nephritis, diffuse nephritis, and especially in chronic interstitial nephritis. They consist, as a rule, of degenerated renal epithelium.

Epithelial Casts (*Fig. R*) when present in the urine, are definite evidence of desquamation of the renal epithelium associated with

disease of the renal parenchyma. The illustration shows an epithelial cast which has undergone fatty degeneration.

Waxy Casts (*Fig. Z*) are strongly refractive, sharply outlined casts, often of a slightly yellow colour. They may be found in the urine in the various forms of chronic nephritis. They are present in the urine in amyloid degeneration of the kidney, but are not characteristic of this condition, and, as a rule, they do not give the amyloid reaction.

Blood Casts (*Fig. X*) are casts which are densely coated with red blood corpuscles, or may (as in the lower figure) be cylindrical blood clots formed within the renal tubules.

White Blood Corpuscles (*Fig. S*).—The character of the cells will vary with the reaction and other properties of the urine. They are larger than red blood corpuscles, rounded, granular, generally colourless, and contain one or more nuclei. In acid urine they appear markedly granular. Acetic acid will dissolve the granules and render the nucleus visible. In alkaline urine they become swollen and transparent, and their nuclei are visible. Leucocytes in the urine are frequently in a condition of fatty degeneration. They may exhibit amœboid movements. When swollen, leucocytes may be difficult to distinguish from epithelial cells ; but on addition of iodo-potassium-iodide solution they stain greyish-brown (glycogen reaction), while epithelial cells assume a light yellow colour.

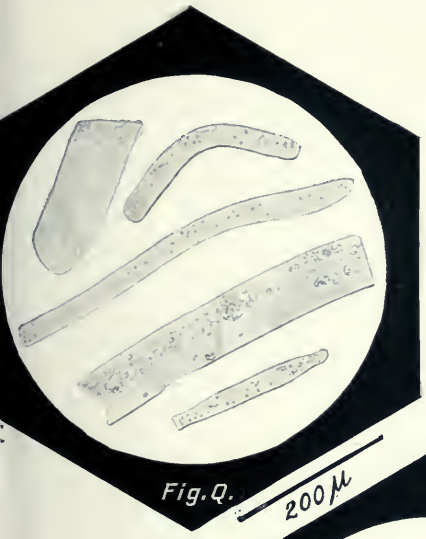
A few isolated leucocytes may be found in almost any urine ; their presence in abundance shows an inflammatory lesion of the urinary passages or kidney. They are also abundant in the urine of the female in conditions associated with leucorrhœa.

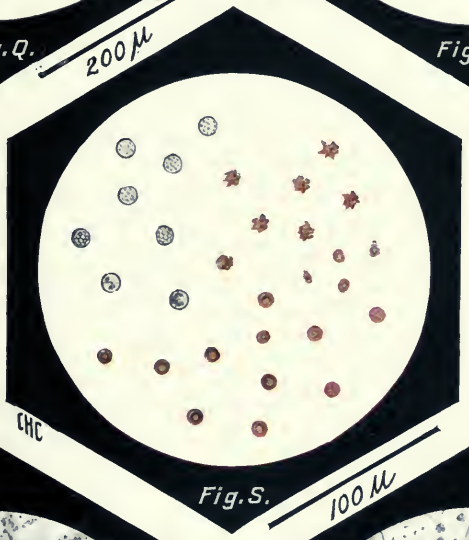
Red Blood Corpuscles.—Unaltered red corpuscles are easily recognizable by their biconcave form and faint yellow colour. Their appearance is influenced by the reaction, the concentration, and the length of time they have been present in the urine. In acid urine they may persist for a long time, while in the urine of alkaline fermentation they are rapidly disintegrated. In concentrated urine they may appear small and crenated, while in dilute urine they may appear swollen and faint in outline, the so-called blood shadows.

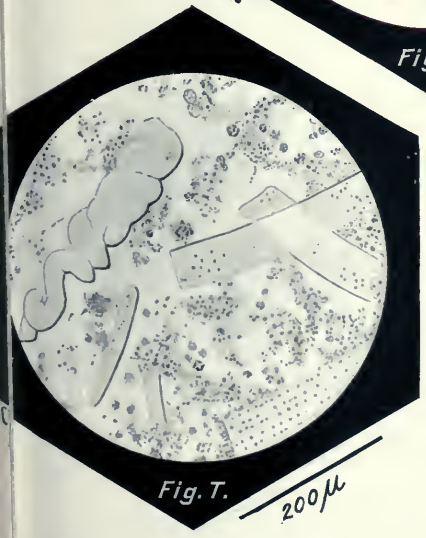
In the male subject red blood corpuscles always indicate a morbid change ; in the female, they may have their origin in menstruation.

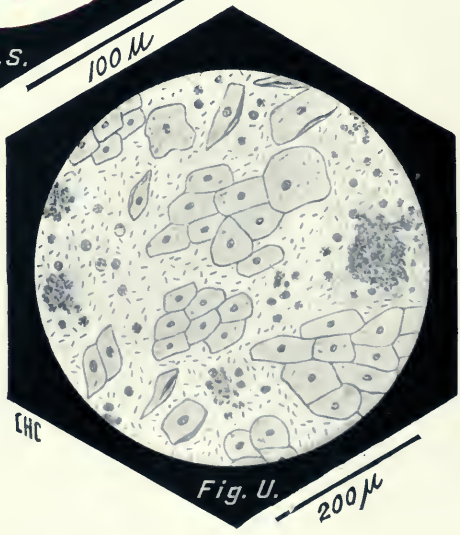
Chronic Interstitial Nephritis (*Fig. T*).—Deposit from the urine of a patient suffering from chronic interstitial nephritis, forty-eight hours before the fatal termination. The figure shows numerous hyaline casts, straight, with adherent urates, a large convoluted colloid or waxy cast, renal cells, epithelial débris, leucocytes in a state of degeneration, and amorphous urates.

Cystitis (*Fig. U*).—Deposit in an acid urine, cystitis from colon infection. Figure shows numerous polygonal epithelial cells of varying size, single or in tesselated collections, with rounded nuclei. A few tailed cells are present. Leucocytes in various stages of degeneration are seen collected in masses or singly. Numerous rod-shaped bacilli are present.









URINARY DEPOSITS—*continued*

URINE. *Francis D. Boyd, M.D.*

Albumin.—For the quantitative estimation of albumin in urine, Tsuchiya[1] advises a modification of Esbach's method. The reagent consists of phosphotungstic acid 1·5 parts, concentrated hydrochloric acid 5 parts, in 100 parts 90 per cent alcohol. While this is an improvement upon the Esbach method, it has a number of disadvantages, which has led Jolles[2] to advise the use of a formol solution for the precipitation of albumin. Jolles' method, however, whilst accurate, is unsuitable for use outside the laboratory.

Goodman and Stern,[3] making use of Tsuchiya's reagent, devised a trituration method which is accurate and convenient, and appears to have none of the disadvantages of that of Esbach. The method depends upon the fact which they determined that 0·0001 gram of albumin caused a cloudiness or turbidity in 5 cc. of the acid reagent. In carrying out the procedure the Heller test with nitric acid is first applied, and if much albumin is present the urine is diluted 1–10; if not, the urine is used undiluted. Five cc. of the phosphotungstic acid solution are put in a test tube. The filtered urine is taken in a pipette graduated in tenths of a cubic centimetre and added to the urine five drops at a time till a whitish cloud appears. The number of tenths of a cubic centimetre used is read off and expressed in terms of 100 cc. For example, if 1 cc. diluted urine (1–10) is required to produce turbidity, there is 0·0001 gram albumin in 1 cc. diluted urine; 0·0001 gram albumin in 0·1 cc. undiluted urine, which is equal to 0·1 gram albumin in 100 cc. urine or 1 gram per 1000 cc. urine. Again, say 0·7 cc. diluted urine (1–10) is used, then 0·07 undiluted urine contains 0·0001 gram albumin, 7 cc. urine contains 0·01 gram albumin, 700 cc. urine contains 1 gram albumin; therefore 700 : 1·0 :: 100 : x or 0·142 per cent albumin. The method is easy of application, and is more accurate than the older one of Esbach.

Detection of β-oxybutyric Acid.—A new and simple method for the detection of β-oxybutyric acid by the removal of acetone and diacetic acid by heat followed by the oxidation of β-oxybutyric acid to acetone by hydrogen peroxide, is described by J. Stuart Hart.[4] Ten drachms of suspected urine is mixed with an equal quantity of water, a few drops of acetic acid are added, and the mixture is boiled till the bulk is reduced to a quarter of the original, i.e., about 5 dr. The residue is diluted with an equal quantity of water, and the mixture is then divided between two test tubes. To one is added 17 min. hydrogen peroxide, and the tube gently warmed and subsequently cooled. To each test tube are added 8 min. glacial acetic acid and a few drops of freshly prepared solution of sodium nitroprussiate. In each tube this is overlaid with a drachm of concentrated solution of ammonia. If β-oxybutyric acid is present, the tube to which the peroxide has been added will show a purplish-red contact ring; if it is absent the two tubes will remain the same. The test will detect β-oxybutyric acid as low as 0·3 per cent.

Sugar Estimation.—A simple method is described by Hamill.[5] The only instruments required are a test tube and spirit lamp, and a specially constructed pipette small enough to be carried in the pocket. the pipette is constructed to deliver 2 cc. between two marks on the stem. By its means 2 cc. of Fehling's solution are delivered into a test tube, and there diluted with an equal quantity of water. The pipette is now washed with water and filled with urine to the upper mark. The Fehling's solution is boiled, and the urine is allowed to fall drop by drop into the boiling solution until the colour is discharged. The tube between the marks already mentioned is graduated, so that the percentage of sugar in the urine is read off directly from the volume of urine used. If the sugar content exceeds 3 per cent, the urine should be diluted to bring it within the limits, 1 to 2 per cent, and another estimation should be carried out. The result obtained is correct within 5 to 10 per cent of the total quantity of sugar present, an accuracy quite sufficient for clinical purposes, when the frequently large initial error in collecting the urine over a 24-hour period is taken into consideration.

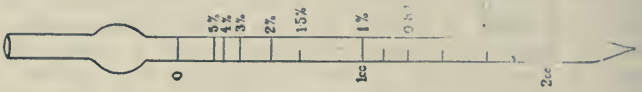


Fig. 105.—Pipette for estimating sugar in urine.

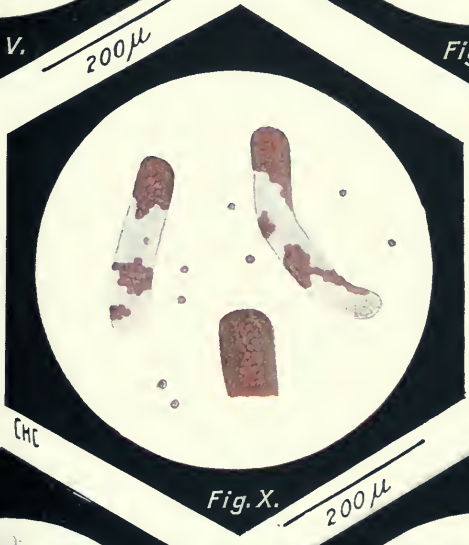
The principle on which the pipette is graduated is as follows :— 2 cc. Fehling correspond to 10 mgrams sugar. Now

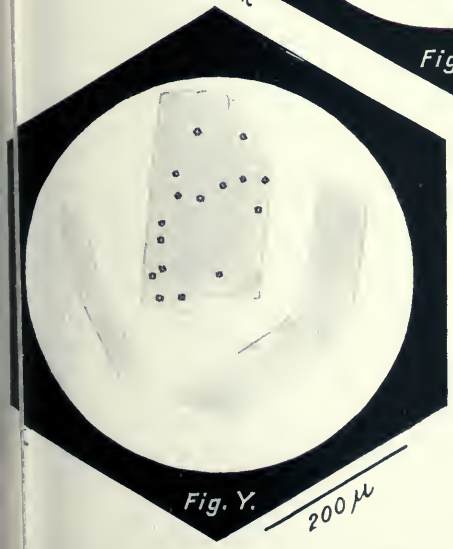
0·2 cc.	urine	containing	per cent.	sugar,	
0·25 ,,	,,	,,	4	,,	,,
0·33 ,,	,,	,,	3	,,	,,
0·5 ,,	,,	,,	2	,,	,,
1·0 ,,	,,	,,	1	,,	,, etc.,

contain this quantity of sugar ; accordingly, marks made on the pipette to indicate the delivery of these quantities represent the above percentages of sugar respectively.

The pipette (*Fig.* 105), whose length does not exceed 6 or 7 inches, can easily be constructed from ordinary glass tubing, or can be obtained from Messrs. Baird and Tatlock, Hatton Garden. A small bulb or dilatation in the neck of the pipette is of advantage in diminishing the risk of fluids being sucked into the mouth.

Another simple method is described by T. J. Walker.[6] He makes use of a chart (*Fig.* 106), which he has had constructed, by which the amount of sugar in a given quantity of urine can be read off. In applying the test, draw up into a graduated minim pipette, or a pipette manufactured so that a drop measures a minim, any quantity of the urine to be examined. Boil 30 min. of Fehling's solution in a test-tube, and into it deliver the urine from the pipette drop by drop (boiling momentarily after the addition of each drop) until the blue colour is discharged from the solution. Note the number of minims of urine used. Now refer to the chart, and having found the corresponding figure there,





URINARY DEPOSITS—*continued*

trace the vertical line upward till it meets the curve—the figures there found indicate the percentage of sugar and the number of grains per fluid ounce in the urine. If the urine contains 5 per cent or more sugar, it must be diluted and the process repeated with the diluted urine. Copies of the chart may be obtained from Messrs. Down Bros.

Test for Blood.[7]—Albarran and Heitz-Boyer bring forward a new and delicate test for blood in the urine which has been found useful when complete hæmolysis prevents the detection of blood corpuscles by the microscope. The reagent used is an alkaline solution of phenolphthalein, prepared by boiling phenolphthalein, 2 grams; anhydrous potassium, 20 grams; powdered zinc, 10 grams; in 100 grams of distilled water. The clear, colourless filtrate may be kept for months. Half a drachm of this reagent is shaken with a

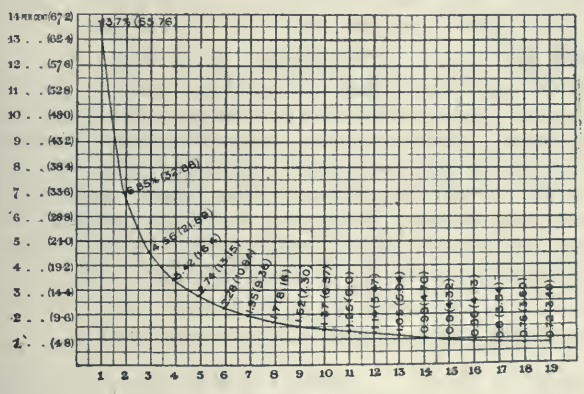


Fig. 106.

Fig. 107.

Figs. 106, 107.—Dr. Walker's Chart, and Pipette for use with it in Urine Testing. The figures opposite the horizontal dark lines of the chart, as well as those on the curved line crossing the chart, indicate the percentage of sugar, and the corresponding number (figures between brackets) of grains of sugar per fluid ounce. By "percentage" is understood "weight in volume"—i.e., grains per 100 minims. The figures below the vertical dark lines indicate the number of minims of urine consumed in discharging the blue colour from 30 minims of Fehling's solution.

drachm of the urine to be tested, and then a few drops of ordinary oxygenated water is added. A red fuchsin colour is positive, the intensity depending upon the amount of blood present. The test is positive for blood present in the amount of 1–100,000. The test is specific for blood or hæmoglobin; it is delicate and free from fallacies.

The Urine in Diseases of Infancy.—Morse and Crothers,[8] in considering the analyses of the urine of 667 cases admitted to their Infants' Hospital, find that, putting aside diseases of the gastro-intestinal tract, albuminuria and renal casts are more often found in pneumonia and meningitis than in other acute diseases of infancy. Their findings do not corroborate the supposed importance of otitis media in the etiology of nephritis in infancy, nor the frequency of nephritis as a complication of eczema, as urged by many Italian and French authors.

The kidneys are not as a rule affected in diseases of nutrition, although in scurvy and severe anæmia the urine may show the evidences of the hæmorrhagic tendency characteristic of these diseases. Affections of the kidneys secondary to other diseases in infancy do not usually produce œdema, and conversely, œdema in infancy is usually due to some other cause than diseases of the kidneys. The presence of albumin and casts in the urine in acute diseases of infancy is the manifestation of an unusual degree of toxæmia, and is to a certain extent of bad prognostic import. This conclusion is justified only in a very general way, however, as many infants showing albuminuria and casts recover, and many others in which the urine is normal do not.

References.—[1]*Centr. f. inn. Med.* 1908, p. 105 ; [2]*Ibid.* Mar. 1909 ; [3]*Jour. Amer. Med. Assoc.* Dec. 1908 ; [4]*Amer. Jour. Med. Sci.* June, 1909, p. 869 ; [5]*St. Bart's. Hosp. Jour.* July, 1909 ; [6]*Lancet*, Mar. 1909, p. 680 ; [7]*Presse Méd.* 1909, 361 ; [8]*N.Y. Med. Jour.* Mar. 1909.

UTERUS, CANCER OF. *Victor Bonney, M.S., M.D., F.R.C.S.*

At the Annual Meeting of the British Medical Association a resolution was passed with a view to disseminating a knowledge of the importance of the early recognition of uterine cancer. A Committee was appointed to draw up an appeal to the practitioner, impressing upon him that cancer uteri is at first a local and often a curable disease, and that its early recognition is not difficult. Operation is the only remedy, and when performed early is not attended by great risk. The appeal is of such importance, that it is necessary to quote it in full.

Symptoms.

Uterine cancer is at first a painless disease which does not affect the general nutrition.

The early symptoms of cancer are : Irregular bleeding of any description, even if there be only traces ; bleeding post coitum ; and watery, blood-tinged discharge. There may be no loss of strength or wasting, nor any condition to alarm the patient. Pain, wasting, profuse bleeding, and foul discharge, indicate advanced disease.

As the majority of cases occur between the fortieth and fiftieth year, the symptoms are too often regarded by the patient as due to " change of life." The medical attendant should not accept this assumption until he is satisfied that cancer does not exist.

Bleeding, however slight, occurring after the menopause, should give rise to suspicion that cancer is present.

Diagnosis.

An examination should be made, even if bleeding is present, as valuable time may be lost by postponement until the hæmorrhage has ceased.

In the early stages, new growth may be found on the surface of the vaginal portion of the cervix, in the lining of the cervical canal, or in the substance of the cervix. Any prominence on the surface of the vaginal portion, or any ulceration, i.e., a definite loss of substance, should at once arouse suspicion. A nodule or nodules, hard, inelastic, or irregular in outline, felt in the substance of the cervix, suggest the presence of cancer. If the whole cervix be affected, the relative hardness as compared with the soft elastic body, is pronounced.

The detection of high-lying cervical cancers, and cancers of the body of the uterus, is only possible after curettage or digital exploration.

The signs common to the early stages of cancer of the cervix uteri are: (1) The definite occurrence of new growth on the surface of the vaginal portion of the cervix, in the lining of the cervical canal, or in the substance of the cervix; (2) Friability; (3) Bleeding on manipulation.

1. The definite occurrence of new growth on the portio vaginalis or in the cervical canal cannot fail to arouse suspicion. When, however, thickening of one lip or a portion of one lip of the cervix exists, the nature of the growth is difficult to determine if the mucous covering be still intact. It is then necessary to remove a portion of the affected tissue, and examine it under the microscope.

2. Friability is a sign of the greatest importance, and may be tested by the finger-nail, curette, uterine sound, or ordinary long probe. Degrees of friability exist in early cases, depending upon the amount of interstitial tissue contained in the growth.

3. The occurrence of free bleeding after the slightest manipulation is, when combined with friability, a valuable diagnostic aid.

Cancer beginning in the cervical canal is not difficult to detect where the os uteri is dilated, as in many multiparæ. The finger passed into the cervical canal, feels irregular elevations or nodules from which portions may be removed. Free hæmorrhage follows this manipulation. Difficulty arises where the os uteri is not dilated, and the disease is hidden. A sound, carefully passed into the cervical canal, may give the impression of impinging on an irregular nodular surface, or friable tissue may be removed by the curette. Free hæmorrhage following such manipulations, is a suspicious sign. Thickening and hardening of the cervix may be detected by a rectal examination, which is most helpful in detecting cancerous nodules in the cervical walls, and should always be made in such cases.

If the vaginal portion of the cervix, the cervical canal, and the cervical walls, have been proved to be free from disease, attention must be directed to the body of the uterus. The uterus may not be enlarged, although a cancerous growth exists in its interior. Usually, however, there is some increase in size, which in advanced cases may be considerable.

Microscopical Investigation.

In doubtful cases, if there be a suspicious hard nodule, erosion, or ulcer, on the external os uteri, a piece, including a boundary of healthy tissue, should be excised.

The vulva and vagina having been thoroughly cleansed, the posterior vaginal wall should be retracted by means of a speculum, and the cervix pulled slightly downwards with a volsellum. A wedge-shaped piece, the size of a pea or bean, including *a margin of healthy tissue*, should be excised with a sharp knife.

The bleeding which follows this little operation should be stilled by the insertion of one or two sutures, or by firm tamponade with a strip of gauze. An anæsthetic is not essential. The patient should be kept in bed for twenty-four hours.

The tissue removed should be transferred to a small, stoppered bottle filled with absolute alcohol or methylated spirit, and forwarded without delay to an expert in uterine pathology.

Where the cancer originates in the body of the uterus or in the cervical canal, it is frequently possible, by using the curette, to obtain a sufficient amount of tissue for examination without the aid of anæsthetics. If this cannot be done, it may be necessary under an anæsthetic to curette the whole interior of the uterus and cervix, special attention being paid to the region of the tubal orifices. All fragments should be collected, including those which may have been washed out. The douche, if employed, should consist of sterilized water, or a weak solution of corrosive sublimate (1–10,000), as carbolic acid and lysol interfere with the staining of the cells.

The fragments should be transferred to a stoppered bottle filled with absolute alcohol or methylated spirit.

If the expert's report is favourable the patient will be reassured, if unfavourable, immediate operation is imperative.

Forms of Uterine Cancer.

Vaginal portion of the cervix :—

1. *Infiltrating Type.*—In this type, one lip, or a portion thereof, or even the entire vaginal portion of the cervix, is infiltrated with cancerous growth. Ulceration occurs early from the surface inwards, or necrosis may begin in the centre, and opening on the surface, lead to the formation of a deep ulcer, with undermined edges.

The growth is somewhat hard in consistence, but is still friable if tested with the probe, curette, or finger-nail.

2. *Papillomatous or Polypoid Type.*—This includes the so-called cauliflower excrescence, and is characterized by the growth from the margin of the os externum of a rounded or flattened tumour, varying in size, which may or may not have a definite stalk. It has a papillary surface, bleeds readily, and is very friable. More rarely, it resembles a bunch of soft papillomata. Portions of the growth, pale red or greyish-yellow in colour, easily are detachable on examination.

3. *Superficial Flattened Type.*—This is characterized by a flattened growth on the vaginal portion, which tends to spread over its surface. It is prone to early ulceration, and is frequently seen clinically as an ulcer. The lip or portion affected is thickened. The ulcer has a sharply defined, raised edge, indented at places, yellowish-grey, finely granular surface, a moderate amount of loss of substance, and an infiltrated base. It bleeds readily on touch, and the amount of hæmorrhage is entirely out of proportion to the amount of injury inflicted. The finger-nail can detach small pieces from its surface.

Cervical Canal :—

1. *Superficial Type.*—The inner surface of the cervical canal is lined by an irregular papillary growth which at first attacks the substance of the cervix superficially. As the growth increases, portions of it may protrude through the external orifice of the cervical canal. When ulceration occurs, the superficial portion of the growth is shed, with consequent hollowing out of the cervical canal, whilst the remainder of the periphery of the cervix is more or less thickened by infiltration. Where the external os uteri is narrow, the process may be hidden, or patency of the os uteri may be produced by destruction of its margin, whilst in uteri where the os is already wide a crater-like cavity is formed.

2. *Infiltrating type.*—The cancerous infiltration proceeds from the mucous membrane deep into the tissues of the cervix, and thus the whole cervix becomes thickened and enlarged, or the enlargement and infiltration may be limited to one or more portions of the cervical walls. Necrosis may commence on the mucous surface, or in the centre of the infiltrated area, and may lead to extensive destruction of the cervical tissues.

Carcinoma of the Cervix.—Comyns Berkeley[1] published, at the beginning of the year, the results of 30 cases of the radical abdominal operation (Wertheim) performed by himself and Victor Bonney. He also collected 243 cases performed by different English operators. He exhaustively reviewed the present status of the operation, and compared it with the older procedures under the heads of primary mortality, percentage operability, percentage of cures. The primary mortality is still high. In the series performed by Victor Bonney and himself it was 16·6 per cent, whilst in the series performed by different operators it was 18·2 per cent. These figures compare well with Continental figures, e.g., Doderlein, 18·7 per cent. The mortality

for vaginal hysterectomy, from a large number of collected cases, is about 9 per cent. It is to be remembered, however, in considering these figures, that cases of a much more advanced and serious character are dealt with by the radical operation. Berkeley divided 238 of the cases collected by him into three groups, with the following result: 186 advanced cases, mortality 23·1 per cent; 19 moderate cases, mortality 5·2 per cent; 33 early cases, mortality 6·3 per cent; thus showing that, when the operation is performed on a similar class of patients to those dealt with by vaginal hysterectomy, the *mortality is actually lower*. The percentage operability is greatly increased by the radical operation. The series of 30 cases operated on by himself and Victor Bonney represented 67 per cent of all the cases seen by them during the period covered. According to Doderlein and Kronig, the average operability of ten Continental operators was 68 per cent. English figures beyond those stated were not accessible. The average operability by the vaginal operation, on the other hand, varies from 30 to 14 per cent on the Continent. In England, it is probably about 12 per cent. Turning to the percentage of permanent cures, i.e., cases free from recurrence after 5 years, all the English cases are too recent to draw conclusions from, but abroad, Wertheim claims a percentage of real cures of 62, Pollisson 60, Mackenrodt 45, and Bumm 30 per cent.

Of cases treated by vaginal hysterectomy, it would appear from a large number of Continental statistics that not one-tenth of those thus operated upon survived after five years. In England, Spencer and Lewers claim 24 per cent and 16 per cent respectively, as their percentage of cures by vaginal operation; but it is also to be remembered that the standard of operability in England is considerably below that in Germany and Austria. After vaginal hysterectomy the greater proportion of recurrences occur in the vaginal scar, showing that the operation was inefficient to prevent local recurrence. Recurrence after the radical abdominal operation, on the other hand, is comparatively infrequent in that position, but affects the glands and cellular tissue left behind in the pelvis. About one-third of the patients operated on by the radical method have already glandular involvement. The statistics of the Middlesex Hospital Cancer Investigation Department show that less than 50 per cent of the patients dying there of cancer of the cervix show cancerous glands post mortem. The question of the routine removal of the pelvic glands, whether enlarged or not, is not yet decided. Berkeley himself removes them, as freely as time and circumstances will permit, in every operation, a practice also carried out by the writer of this section.

The paper proceeds to a comparison with the operation of paravaginal section, and concludes with a very full description of the technique and difficulties of the radical abdominal procedure. It constitutes a communication of the highest importance, and should be carefully studied by all interested in the advanced surgery of carcinoma of the cervix.

Victor Bonney,[2] writing on the pathology of carcinoma of the cervix in relation to its prevention and treatment, pointed out that the disease in question does not arise as a result of mere fortuitous circumstances, but is in all cases led up to through a series of well-defined pathological changes in the cervix. These changes are those of a chronic cervicitis exhibiting constant characteristics. It bears a definite relation to active sexual life, cases of carcinoma of the cervix in undoubted virgins being almost unknown. The importance of cervicitis is therefore very great, and it is incumbent on the profession to educate the public in this matter. Chronic leucorrhœal discharge implies cervicitis, and there can be no doubt that every married woman over 30 years of age, who suffers from such, carries about with her the potential antecedent of carcinoma. Chronic cervicitis, then, should be treated early, either by scraping with a sharp spoon, by tracheloplasty, or by amputation of the vaginal cervix. The latter operation is a very good one, being simple, and if properly performed, leading to no ill results.

As regards the treatment of the established disease, radical **Hystero-vaginectomy** on the lines described by Wertheim is the only method to be entertained in the majority of cases. The general operative mortality is in skilled hands somewhere between 16 and 18 per cent; but each case is a law unto itself, and average results must not be applied rigidly to individuals. It is to be remembered that since at least 60 per cent of all cases of carcinoma of the cervix are now "operable" by this method, the general figure is largely drawn from the results of advanced cases. Where the disease is early, or only moderately advanced, the death-rate from the operation is probably not higher than 6 or 7 per cent.

There are a few cases in very obese patients in which radical hystero-vaginectomy by paravaginal section is to be preferred. I have performed this operation with satisfactory results; but it is impossible to effect so complete a clearance of the pelvis as can be done through an abdominal incision, and it should therefore be reserved for the limited group of cases I have indicated.

References.—[1]*Brit. Jour. Obst. and Gyn.* Mar. 20, 1909; [2]*Pract.* June, 1909.

UTERUS, DISPLACEMENTS OF. *Victor Bonney, M.S., M.D., F.R.C.S.*

The subject of uterine displacements has as usual been much written about. Brewis[1] says the treatment of *uncomplicated retroversion* of the uterus consists in **Replacement and Retention.** The pessary is usually only palliative. If a pessary has been worn for some months, and after its removal the uterus falls back again, the pelvic structures have lost their power of supporting the uterus. The great drawback to pessary treatment is its indefiniteness, both as regards the length of time it will have to be worn and the results obtained from wearing it. A uterus that has been retroverted for some time becomes congested, large, and tender. Before attempting its replacement, these conditions should be treated. Brewis uses the following prescription :—

℞ Boroglyceridi Aluminis	āā ʒss	|	Glycerini	ad ʒxvj

Pledgets of cotton-wool are soaked in this mixture, and introduced into the vaginal vault with the aid of a Sims' speculum. It is in many cases better to give an anæsthetic when replacing the uterus, because of the greater freedom of manipulation that it ensures. But in spite of the fact that the patient does in many cases feel perfectly comfortable, and indeed may have no desire to part with her pessary, yet the condition is not cured. Remove the instrument, and the uterus at once falls back again. This is the most unfortunate feature of pessary treatment.

If surgical measures are to be undertaken, Brewis considers that the operation of extraperitoneal shortening of the round ligaments is the only one worth considering. The operation as performed by him over 200 times has been entirely satisfactory. Most of the cases exhibited uncomplicated retroversion, but in 67 the operation was performed in the hope that the ovarian enlargement from which the patients were suffering might be benefited by the improved position of the uterus.

Sir W. J. Sinclair[2] has written an interesting article on the effects of **Ventrofixation** of the uterus on pregnancy, parturition, and the puerperium. He considers that the difficulties following the operation are due to incorrect technique at its performance. He is particularly opposed on this score to Kelly's method of fixation of the posterior wall. He reviews and condemns the technique of other authors, and refers to the "staggering array of modifications of the operation of shortening the round ligaments." He then proceeds to describe his own method of ventrifixation. It differs in principles and organic details from the methods described in many articles and text-books, and aims at maintaining the uterus in a position the most nearly attainable to normal anteversion without undue tension at any point.

Many of his cases have subsequently borne children successfully, and in none, to his knowledge, have any difficulties in pregnancy or labour been caused by it.

Lawrie McGavin[3] has applied the use of **Silver Filigrees,** which he has already successfully carried out in cases of ventral hernia, to a new radical operation for the cure of complete procidentia of the uterus. The operation itself is a combination of ventrofixation and ventrosuspension, with the addition of a filigree inserted under the peritoneum at the back of the uterus, and the anterior parieties in the neighbourhood of the abdominal wound. The result is the formation of an unstretchable union between the uterine fundus and the abdominal wall. The operation is designed for women past the age of child-bearing, and the author of it anticipates successful after-results. The immediate effects were satisfactory in all the cases in which he has operated.

Inglis Parsons[4] discusses his method of treating uterine prolapse by **Injections of strong Quinine Solution** into the base of the broad

ligaments. He has performed this over 150 times. In 75 per cent the uterus has kept up permanently, 20 per cent were improved, and 5 per cent failed. His method consists of injecting through the vaginal vault a 1–5 solution containing 24 to 30 gr. of quinine into the parametric tissue, under careful aseptic and antiseptic precautions. The injection is followed by an aseptic cellulitis, resulting in the effusion of an organizable lymph which fixes the uterus in position. In order to ensure that this position is satisfactory, a pessary is inserted immediately after the operation, and is retained for three days, after which the effusion into the cellular tissue is sufficient to maintain it. If the perineum is ruptured, it should be repaired, but not at the same sitting in the more severe cases, because post-operative vomiting may strain down the uterus and cause injurious pressure on the perineal stitches. The results of this operation in Inglis Parsons' hands are certainly admirable, as the author of this section can vouch for. It is specially indicated where a patient is unwilling or unfitted to undergo an abdominal fixation operation.

References.—[1]*Edin. Med. Jour.* Aug. 1909; [2]*Lancet*, Oct. 8, 1908; [3]*Pract.* Dec. 1908; [4]*Ibid.* Mar. 1909.

UTERUS, MYOMATA OF. *Victor Bonney, M.S., M.D., F.R.C.S.*

E. McDonald[1] has analyzed 700 cases of uterine myomata from the statistical standpoint, and his conclusions are valuable. The most serious complication is the supervention of malignant disease. It is probable that this disaster will occur in one case out of every 20 between the ages of 40 and 50, one case in every 8 between the ages of 50 and 60, and one case in every 4 between the ages of 60 and 70. Necrosis of the tumour was present in 8 per cent of all cases. It was found with increasing frequency as age advanced, until it was present in one-third of all cases about 60 years of age. His concluding remarks are worthy of quoting *in extenso* :—

" Those adhering to the classical teaching advise that these tumours should be treated expectantly, and that operation should not be undertaken until serious symptoms result. The most serious complications are those of necrosis and malignancy. Were there distinctive symptoms by which the advent of these changes in fibroid tumours could be recognized, the dangers of conservative and expectant treatment might be decreased ; but who can say if a fibroid has become sarcomatous, or how long a cancer will be confined to the uterus ? Sarcoma often occurs without increase in the growth of a fibroid, and adenocarcinoma may cause but little additional discharge or hæmorrhage in a case of fibroids which has excessive menstruation or bleeding. Necrosis, after its advent in a fibroid, quickly advances, and, after necrosis has set in, the dangers of operation from infection are very markedly increased. It is obvious, therefore, that it is advisable to operate upon fibroid tumours before these conditions occur, as there is no means of prognosticating when they may occur, save that the probability is that the percentage of their occurrence will increase with age, so that operation cannot be deferred.

"The expectant treatment offers nothing towards the cure of fibroid tumours, save the hope that the menopause will obliterate some of the symptoms. Treatment by electricity and ergot has fallen deservedly into disuse, and the hope of cure by the menopause is now known to be fallacious. Were those advocating the conservative treatment to take a stand more properly based upon the known facts in the life history of fibroid tumours, they would advocate the delay of operation until the patient approached the age of 40 years, after which the percentage of more dangerous complications is very markedly increased. However, the prevention of these many grave dangers is better than the risk of their occurrence, and it is safer that all fibroids should be operated upon as soon as possible. In this way but few cases would present themselves for operation below thirty years of age; in this series, less than 3 per cent of such cases were operated upon. After that time but one-third of all cases would be operated upon below 40 years of age, so it may be seen that the difference of position between those advocating operation below 40 years of age and those advocating immediate operation is not very great. If operation is done before the grave complications occur, the mortality will be correspondingly low. The position of fibroid tumours is analogous to that of appendicitis. When the operation is one of choice and there are no acute symptoms present, the mortality is very low; when there are acute symptoms, such as necrosis, or weakness from marked hæmorrhage, the mortality is large. Early operation would reduce the probability of death from embolism, which is relatively so common after operations upon fibroids, and there would be but little risk from the cardio-vascular and other systemic diseases."

Myomata and Pregnancy.—Haultain[2] has published an interesting paper on this subject. Myomata are undoubtedly the cause of the sterility commonly associated with them. Of married women having fibroid tumours, about 50 per cent are childless, the general ratio of sterility being only 10 per cent. It is necessary to distinguish between the occurrence of pregnancy with innocuous tumours, and its occurrence with those which in themselves have given rise to signs and symptoms sufficient to attract notice. Of these two classes the first is fortunately much the larger. Small tumours, superficially placed under the peritoneum, are of no moment in pregnancy, while by a happy provision of nature those which, by their size and site, are associated with symptoms, act as a bar to a coincidence which forms a most serious menace to life. Of this smaller but important class, the author has seen ten examples. The dangers involved are tabulated as follows: (1) Pressure from their position or size; (2) Degeneration during pregnancy, or after labour; (3) Interference with pregnancy and labour; (4) Hæmorrhage during or after expulsion of the uterine contents; (5) Secondary post-partum hæmorrhage; (6) Liability to serious septic infection after imperfect expulsion of the ovum. He records ten cases in which laparotomy was necessary, on account of one or another of the dangers he describes. Fortunately, owing

to the usually late development of these growths, the gynæcologist is rarely consulted as to the advisability of marriage in the presence of a myomatous uterus. Haultain's remark on this point is, that a woman with a known myoma is better single, but if married, safer sterile.

As regards treatment, it should generally be expectant in the first instance. Management on these lines must, however, only be adopted if it can be shown that by conserving the life of the child the risk to the mother is not seriously increased. The risk of operative treatment after viability of the child, though increased, is not sufficiently so as to warrant early interference on that account, and should complications arise, they can usually be treated successfully. **Hysterectomy** is the most generally useful operation, though there are a few cases in which **Myomectomy** may be safely adopted.

"Red" Degeneration of Myomata.—Bland-Sutton[3] has written an interesting article on the red degeneration of uterine myomata so frequently occurring in those tumours when associated with pregnancy. The researches of Lorrain Smith and Fletcher Shaw show that this condition is due to thrombosis of the vessels supplying the tumour, which produces a state of red infarction. Tumours which have undergone this change are particularly liable to organismal infection, and they isolated both staphylococci and diplococci from the tissue around the occluded vessels. A specimen removed by this author was investigated by Somerville Hastings, and *Staphylococcus aureus* was isolated in pure culture. A uterus may contain many myomata in its wall, only one of which has been thus affected. A remarkable feature of the pain accompanying this form of degeneration is its acute onset. [In view of its now ascertained causation, this is very interesting, for it brings the symptoms into line with those of red infarction occurring elsewhere.—V. B.]

Myomata and Carcinoma.—The frequency with which myomata and carcinoma of the body of the uterus co-exist has been drawn attention to in the *Annual* in previous years. Munro Kerr,[4] in a paper on adeno-carcinoma of the body of the uterus, lays stress on it. Out of 150 hysterectomies for myomata, carcinoma of the body co-existed four times, whilst out of five cases operated on for carcinoma of the body, three had also myomata existent there.

E. Macdonald[5] has devoted much time to a research on the relation of myomata to malignant disease. Out of a large number of cases collected by him, carcinoma of the body occurred in 2·9 per cent, as against 0·8 per cent for carcinoma of the cervix. This ratio is the reverse of the general, wherein about one case of corporeal disease occurs to six of the cervix. The relation therefore is clear; but whether it is due to the effect of the myomata, or to some common etiological factor, remains to be decided.

REFERENCES.—[1]*Brit. Jour. Obst. and Gyn.* Aug. 1, 1909; [2]*Brit. Med. Jour.* Dec. 5, 1908; [3]*Ibid.* June 10, 1909; [4]*Ibid.* Jan. 23, 1909; [5]*Jour. Amer. Med. Assoc.* Mar. 20, 1909.

VARICELLA. *E. W. Goodall, M.D.*

Varicella is usually a mild disease, and complications of any importance are rare. But J. D. Rolleston[1] relates a case in which a boy aged 16 months, suffering from concurrent scarlet fever and varicella, became the subject of gangrene of the right lower eyelid. The gangrene commenced in a pock just above the external canthus. The outer aspect of the lid only was involved. Treatment consisted at first in dusting the lid with iodoform, and later in applying compresses of sodium citrate (0·5 per cent) and sodium chloride (5 per cent), syringing the area with the same lotion, and giving 5 gr. of sodium citrate internally every four hours. A slight degree of ectropion resulted. The author gives a number of references to recorded cases of varicella with ocular complications.

REFERENCE.—[1]*Med. Chron.* 1909.

VARICOSE ULCERS. *Priestley Leech, M.D., F.R.C.S.*

Murphy,[1] of Chicago, says that, where operation is refused or inadvisable, varicose ulcers can all be cured by the application of **Uniform Inelastic Pressure** from the ankle to the knee. For many years he has used silicate of sodium to make a clam-shell cast to fit accurately and produce uniform compression over the entire area. It is put on in antero-posterior, antero-lateral, or lateral halves, and as the swelling and œdema of the leg recede the edge of the cast can be cut so that the pressure or support of the vessels may not be diminished. The ulcerated area itself is covered with a strip of guttapercha paper or oiled silk, overlapping it half an inch on all sides, with no other antiseptic or aseptic dressings. There will be no discharge from this surface on account of the pressure, and the cast may remain for a week or ten days without odour or discomfort from the secretion. Owing to the inconvenience of changing this, Murphy has lately used a leg corset which has given very satisfactory results. It is constructed of strong, heavy-grade linen or heavy silk, and provided with a double lacer, as shown in *Fig.* 108, and this adjusts the compression readily and accurately at all points. The length of the legging depends on the case; usually it reaches from the ankle to the head of the tibia; it should not, however, include the knee or ankle joints. If it is desirable to encompass the thigh as well as the lower leg, a second legging should be made similar to the first. Light slender stays of material not affected by water are included in the body of the legging to prevent wrinkling. The tongue or flap is of specially

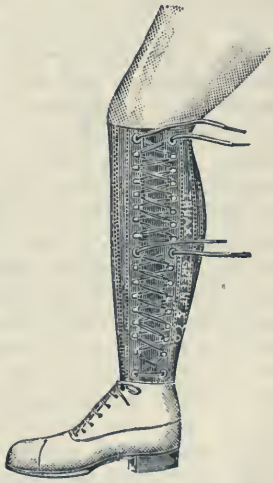


Fig. 108.—Murphy's Leg Corset for varicose ulcers.

firm material in order to avoid linear constriction. Accurate fitting of the corset is essential to obtain the best results.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Mar. 27, 1909.

VARICOSE VEINS. *Priestley Leech, M.D., F.R.C.S.*

J. M. Cotterill[1] gives the following rules for the treatment of varicose veins: (1) Remove the cause as far as possible. (2) Do not treat locally at all unless the varix gives trouble or tends to become worse. (3) When the varix is restricted to the lower leg: try bandaging. (4) When bandaging fails, or when the disease affects the saphena above the knee, do Phelps's or other suitable operation. (5) In thrombosis try rest; if the thrombus is spreading upward, operate. (6) In simple phlebitis try rest and soothing means (cold and sedative lotions); if suppuration occurs, ligature and divide the vein well above the inflamed area, and thoroughly clear out or excise the affected portion of the vein; if the phlebitis is simple and keeps recurring, operate. (7) In infective phlebitis, operate when the local and general condition of the patient admits of it; get well above the inflamed area, cut down on the vein higher up the limb, divide and ligature it, and then proceed to clear out the abscess, excising when possible the affected portion of vein, and render the whole infected area as aseptic as possible. He thinks the best support is a perforated Martin's rubber bandage. **Phelps's Operation** consists of excising an inch or two out of the saphena vein high up, and also at several points further down the limb, specially distended portions of vein being dissected out.

Prof. Schiassi,[2] of Bologna, describes a method of treating varicose veins by the **Injection of a Solution of Iodine.** The solution he uses is as follows: Iodine, 1 gram (15½ gr.); iodide of potassium, 1·6 gram (24 gr.); sterilized distilled water, 100 grams (3½ fl. oz.) Spinal anæsthesia or novocaine injections are used. An incision is made either above or below the condyle of the femur over the distended saphena vein. The vein is exposed for an inch and a half or two inches, and is divided at the upper limit of the incision. The upper end of the vein is ligatured, the lower end is held in forceps, and a small bulbous-ended tube of glass, with a small piece of rubber tube on the open end, is tied in the lumen. A glass syringe is then filled with the fluid, and its end introduced into the rubber tube. The forceps are then removed from the vein, and the blood allowed to fill the glass and rubber tube to avoid the presence of air bubbles; the syringe is then emptied into the vein, and this is repeated until 30, 40, or 50 cc. of the solution have been injected, according to the dimensions and number of the varicose veins. The vein is then ligatured below the tube of glass and the wound sewn up. There is as a rule no pain except occasionally a sensation of burning in the thigh, and this can be prevented by the previous injection of 0·25 per cent of solution of novocaine. The iodine injected spreads itself through all the superficial venous network as far as the malleoli. He has seen no bad results in some sixty cases.

REFERENCES.—[1]*Edin. Med. Jour.* Mar. 1909; [2]*Sem. Méd.* Dec. 18, 1908, and also in *Med. Press*, Apr. 14, 1909.

VAS DEFERENS, DIVIDED (Anastomosis of the).

Priestley Leech, M.D., F.R.C.S.

Several methods of uniting the divided ends of the vasa deferentia have been used by various surgeons. Among these are latero-lateral anastomosis, latero-terminal anastomosis, support by decalcified bone, by a removable silver wire, introduction of a thread of catgut into the lumen as a support, and simple approximation of the divided ends with suture of the tunics. Schifone[1] established the fact that union might take place naturally without surgical interference in some cases of divided vasa in dogs; three cases out of eight thus uniting. Prof. Ugo dall' Acqua[2] has made experiments on 60 dogs and rabbits by various methods, and has obtained successful results by most of them, except with simple lateral suture, terminal-lateral suture, and latero-lateral anastomosis. The best results (4 successful out of 6 experiments) were given by employing a thread of No. 00 catgut placed in the lumen of the divided vessel as a support, and drawing the two divided ends together by two points of suture through the connective tissue of the two ends. He thinks he obtained better results than others by the employment of No. 00 catgut in place of No. 2 or 3.

REFERENCES.—[1]*Il Policl.* (sez. chirurg.), vol. xii. c. 1905; [2]*Ibid.* June, 1909.

VENEREAL DISEASE IN CHILDREN.

C. F. Marshall, M.Sc., M.D., F.R.C.S.

Flora Pollack[1] reports the results of investigation of 187 cases of venereal disease in children treated at the Johns Hopkins Hospital Dispensary. She concludes that acquired venereal disease in children is much more common than is generally supposed, and that it must be attributed to the old superstition that a man may get rid of venereal disease by having connection with a virgin. Clinically, the venereal infections in children run a milder course as regards complications than in adults, but the number of complications and the duration of the disease appear almost the same. The majority of the cases consisted in gonorrhœa and its complications (including 3 cases of arthritis, 19 of peritonitis, and 1 of endocarditis), but double infection with syphilis and gonorrhœa was not uncommon.

REFERENCE.—[1]*Johns Hop. Hosp. Bull.* 1909.

WHOOPING-COUGH. (*See* PERTUSSIS.)

WORMS. *Robt. Hutchison, M.D.*

De Havilland Hall[1] thinks that the directions for the treatment of *Tape-worm* given in the text-books are not sufficiently precise. Thus the dose of the liquid extract of male fern in one standard book is given as 15 to 30 min., in two as 1 to 1½ dr., and in a fourth the dose is stated to be 2 dr. Then as to the method of preparing the patient, one authority says that "in most cases it is sufficient for the patient to have no food

after six or seven in the evening, and to take the anthelmintic before breakfast the next morning." Another only says that " it is advisable for the patient to fast several hours before taking it " (i.e., the anthelmintic). A third advises that the patient should " take only liquids, such as milk and beef-tea for a day," and the fourth advises that for two days prior to the administration of the remedies " the patient should take a very light diet." Only one of the four writers mentions anything as to the necessity of medicinal treatment before the administration of the anthelmintic, and he says that the patient should " have the bowels moved occasionally by a saline cathartic."

Following these totally inadequate directions, it is no wonder that medical practitioners fail to treat cases of tape-worm successfully, and if at times the head is expelled it is more by luck than good management that this happens. In order to ensure success in the treatment of these cases several points must be borne in mind. In the first place, the intestine must be as empty as possible. In the second place the catarrhal condition of the intestines which so often exists in cases of tape-worm must be remedied, as, should the worm be protected by the intestinal mucus, the anthelmintic may not be successful. Thirdly, the advisability of giving the liquid extract of male fern in two doses : it has been suggested that the first dose causes the worm to relax the very firm hold it has upon the intestine, and the second dose kills it right out. And lastly, the administration of a brisk cathartic to bring away the worm and the male fern, so as to prevent any toxic effects on the patient from the latter.

All these indications are met by the following plan of treatment, which he has always found successful. For three days previous to the administration of the male fern the patient should be kept entirely on a liquid diet. A pint and a half of milk and a like quantity of beef-tea answer very well. To promote a free action of the bowels and to favour the removal of mucus, a mixture containing 20 gr. of bicarbonate of sodium, 1 dr. of the sulphate of sodium, and 20 min. of spirit of chloroform, in 1 oz. of peppermint-water, should be taken three times a day. The night before the male fern is given the patient should have a draught containing ½ oz. of sulphate of magnesium with 1 dr. tincture of jalap and 20 min. of the compound tincture of chloroform, in 1 oz. of water. This should be repeated next morning at 7 o'clock if the previous dose has not operated. At 8 a.m. 1 dr. of the liquid extract of male fern made up in a mixture with 1 dr. of mucilage of tragacanth and a drachm of the syrup of ginger in 1 oz. of chloroform water. At 9 a.m. this dose should be repeated. At 11 a.m. ½ oz. of castor oil with a drachm of tincture of jalap should be given, and if the bowels do not act within an hour an enema of a pint and a half or two pints of soapy water should be administered. The motions should be carefully examined to find the head, and if the above treatment has been faithfully carried out it may be sought for with confidence. It is desirable to keep the patient in bed for two or three hours after the bowels have acted, as the male fern may cause faintness.

De Renzi[2] reports successful results from the treatment of cases of *Cysticercus* and *Echinococcus* with **Male Fern.** The cysticercus in his cases[2] were situated in the brain, and the echinococcus in one case in the liver and in the other in the lung. The writer contends that the belief that the drug must come directly into contact with the parasite in order to be effective is erroneous. In his cases its effective action was shown by the disappearance of all symptoms and of the co-existing eosinophilia. He does not state precisely how the male fern was given, but he appears to have administered it in capsules for several days at a time—three being given each morning.

Flynn[3] thinks that **Sulphur** is useful in the treatment of *Threadworms*. He recommends at least 9 gr. daily for adults and 1½ gr. three times a day for a young child, and describes cases which have been cured by it.

REFERENCES.—[1]*Clin. Jour.* Aug. 5, 1908; [2]*Berl. klin. Woch.* Dec. 14, 1908; [3]*Hosp.* Apr. 24, 1909.

WOUNDS. *Priestley Leech, M.D., F.R.C.S.*

In the Bradshaw Lecture[1] Watson Cheyne utters a note of warning to what he calls the extreme school of aseptic surgeons. Too much reliance, he thinks, has been placed upon heat as a means of sterilization, and the use of antiseptics has been too much neglected. The points to which he takes exception, and which might be improved, are the use of dressings which contain no antiseptic; the use of gauze in place of drainage tubing; the use of saline solution in place of an antiseptic solution in which to wash soiled hands and instruments during an operation. Minor points are the use of swabs instead of marine sponges, and the avoidance of catgut. As regards catgut, he has never had any ill effects following its use, and he uses Lister's chromic catgut kept in 1–20 carbolic lotion. The use of towels dipped in some antiseptic solution gives an added sense of security, and leaves fewer loop-holes for the introduction of micro-organisms, and although the atmospheric dust may not contain many pathogenic organisms, the use of an antiseptic lotion in the instrument tray, and for the towels surrounding the wound, will render harmless any micro-organisms that may be present.

REFERENCE.—[1]*Lancet*, Dec. 19, 1908.

WOUNDS, SEPTIC. *Priestley Leech, M.D., F.R.C.S.*

M. Toubert,[1] in cases of severe septic wounds, employs the following procedure. If necessary, the wound is opened up, and compresses, soaked in a 1·5 per cent emulsion of **Essence of Turpentine,** are applied. This causes a thorough disinfection of the wound and healthy granulations. In addition to this, he injects a 5 per cent emulsion of the same essence hypodermically. He claims to have obtained excellent results by this means in three cases of serious infection of the leg.

REFERENCE.—[1]*Sem. Méd.* Oct. 28, 1908.

YELLOW FEVER. *J. W. W. Stephens, M.D.*

W. C. Gorgas[1] describes a model organization suitable for dealing with yellow fever, but carefully points out that if a model scheme cannot be got it is wise to take the next best. (1) The necessary funds being collected, a system of account-keeping must be adopted. (2) An ordinance should be passed declaring it a nuisance for any property owner to have on his premises any mosquito larvæ, and prescribe a fine. (3) A second ordinance should give the sanitary officer authority to abate these nuisances himself, if not abated by the owner of the property after a week's notice, the cost to be recovered from the owner through the courts. (3) A third ordinance should direct that all collections of water likely to breed mosquitoes must either be abolished or screened. (4) The municipality should then be divided into inspection districts with an inspector in charge of each district. He should report on each house in his district once a month (25 houses can be inspected daily). The reports should be presented daily and action taken on them at once. The work done by the sanitary inspector's men includes screening barrels, cisterns, etc., gutter repairing, draining. All suspects must be reported to the health officer, and the patient should be screened either at home or in hospital, and a guard put over him. The anti-mosquito work done in Havana has not only abolished yellow fever, but practically also malaria. Gorgas considers that yellow fever will entirely disappear within this generation.

C. Vargas[2] found that a positive diazo-reaction was obtained in nine out of twenty-two cases of yellow fever. The reaction was positive in those cases only that had albuminuria. Frequently the urine gives also an indican, but seldom a bile reaction. Indican is also found in a variety of other urines.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* Apr. 3, 1909; [2]*Berl. klin. Woch.* May 10, 1909.

Part III.—Miscellaneous.

SANITARY SCIENCE, 1909.

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CLOSURE OF AND EXCLUSION FROM SCHOOL.

A Memorandum has been issued during 1909, dealing with the important subject of the closure of schools, or the exclusion of individual scholars, in connection with the prevention of the spread of infectious diseases occurring amongst children attending Public Elementary Schools. The Memorandum is signed conjointly by the Medical Officer of the Local Government Board and the Education Department, and emphasizes the importance of co-ordination of work of Medical Officers of Health and of School Medical Officers and other School Officers.

School closure is recommended as a last resort, and to be used only in exceptional circumstances, e.g., infectious illness in the teacher's family, disinfection and cleansing of school premises, defective drainage, when individual scholar exclusion has failed, want of co-operation between the Public Health and the school authorities, etc. To quote the Memorandum, "Closure of schools should be advised by the Medical Officer of Health only in circumstances involving imminent risk of an epidemic, and not then as a matter of routine nor unless there be a clear prospect of preventing the spread of infection such as cannot be expected from less comprehensive action."

In scattered rural districts, school closure is more often needed than in towns, owing to the fewer opportunities which exist in the former for intercourse between the children of different households elsewhere than at school, and the less effective means of isolation and of tracing doubtful cases.

Exclusion of individual children is the routine that must be practised carefully and systematically—not only of children suffering from dangerous infectious disease, but also of all children of an infected household, and all known contacts. Missed. mild and unrecognized, and carrier cases require special attention and investigation.

Power is given both for compulsory school closure and exclusion of children in Article 57 of the New Educational Code of 1909 to the Sanitary Authority or two members thereof, acting on the advice of the Medical Officer of Health; whilst the School Medical Officer has the power to advise or approve of school closure (Article 45, *b*) and to exclude children (Article 53, *b*). There is now no appeal against requirements of the Sanitary Authority made in accordance with the terms of Article 57.

Infection in schools is spread to a much greater extent by infectious persons than by infected things.

DISINFECTION OF SCHOOL PREMISES.

Much attention has been given during the year to the question of the disinfection of school premises, the necessity or otherwise of daily disinfection (e.g., by one or other of the well-known disinfecting solutions) of schoolroom floors, walls, and ceilings. There are two extreme views put forth: (1) That of the disinfectant manufacturers, viz., that the systematic and periodic disinfection of all class-rooms daily (or oftener) is a necessity; and (2) That of certain well-known Medical Officers of Schools, viz., that any disinfection of class-rooms is useless and an unnecessary expense. The truth is to be found in the middle course, viz., the recognition of the fact that infection arising in or from schools is oftener due to personal contact amongst infected scholars than from infected school floors, walls, ceilings, etc., with the consequent corollary, therefore, as to the need for careful medical inspection of the scholars and the *occasional* disinfection of school premises as may be found necessary. This is the official view of the Board of Education, which states as follows: "Infected scholars are to be discovered, and excluded from schools, together with all 'contacts,' or 'suspects;' whilst disinfection of special class-rooms, or of particular articles, is to be undertaken when there is reason to believe that these have been infected." The danger, from the point of view of infection, is mentioned in connection with the moistening of slates with saliva, from the use in common of penholders and pencils, which are apt to be put in the mouth, and the consequent necessity of steps being taken to avoid this.

Frequent and thorough washing of class-rooms and cloak-rooms are recommended for removing both dust and infection, and the importance is emphasized of the sanitation and ventilation of school-rooms and cloak-rooms, and the preventing of children having to sit in schools in wet clothes and with wet feet. Overcrowding favours the spread of infection amongst scholars.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

During 1909, an epidemic of cerebro-spinal meningitis occurred in Paris, together with scattered outbreaks throughout the provinces. The cases have been carefully reported upon by Dr. Netter, of the Hôpital Trousseau, and by other observers. The predilection of the disease for children is noted, and explained as due to the relatively free communication existing during childhood between the nasal fossæ and the meninges.

The value of anti-meningococcic serum has been proved, the mortality having been reduced 40 to 60 per cent, and recovery having been rapid, with few sequelæ. The best results were obtained with sera prepared by Flexner at the Rockefeller Institute in New York, and by Dopter at the Institut Pasteur in Paris—the sera being injected into the spinal theca (after lumbar puncture) daily for three or four days, and to an amount of 20 to 30 cc. for children, and 30 to 45 cc. for adults, respectively.

The vitality of the meningococcus outside the human body is feeble, and quickly destroyed by drying or by disinfectants, and cerebro-spinal fever is but very slightly contagious, though it is spread by healthy "carrier" cases, who, on the other hand, rarely, if ever, develop the disease themselves.

The cerebro-spinal fluid is generally turbid, containing polymorphonuclear leucocytes; but variations from this type have been noted, e.g., clear (with mononuclears) at the beginning and in the late stage of the disease, clear (with lymphocytes) in rapid and malignant cases, etc.

The prophylaxis of the disease requires the isolation of "carrier" cases, and the disinfection of their nasal cavities, in which the meningococci lodge. For this disinfection, insufflation of dried serum and spraying with pyocyanase are recommended.

Finally, Vincent's precipito-reaction method of bacteriological diagnosis is explained. The suspected fluid is centrifugalized, and the clear supernatant fluid poured into three tubes. To two tubes a drop of anti-meningococcic serum is added, whilst the third tube is kept as a control. The two inoculated and the control tubes are hermetically sealed and placed in an incubator at 55° C. After eight hours, if the reaction is positive, a turbidity will be noted, due to the precipitation of the soluble products of the meningococcus by the specific serum.

LADY HEALTH VISITORS.

The Local Government Board on September 4th, 1909, issued the Health Visitors (London) Order, 1909, under Section 6 of the London County Council (General Powers) Act, 1908, and such Order deals with the appointment of Lady Health Visitors in London, the Board being of opinion that much importance attaches to the appointments in view of the provisions of the Notification of Births Act, 1907. The primary duties of the Health Visitors are "to give to persons advice as to the proper nurture, care, and management of young children, and the promotion of cleanliness." All appointments are subject to the approval of the Board, and the required qualifications of Health Visitors are as follow :—

(*a*). Duly qualified medical practitioner within the meaning of the Medical Acts ;

(*b*). Certificated under the Midwives Act, 1902 ;

(*c*). Qualified for the appointment of nurse by having undergone, for three years at least, a course of instruction in the medical and surgical wards of a hospital or infirmary which is a training school for nurses and has a resident physician or house surgeon ;

(*d*). Undergone for a period of not less than six months, in a hospital or infirmary which receives children as well as adults, and has a resident physician or house surgeon, a course of instruction including subjects relating to personal hygiene, and received the certificate of the Royal Sanitary Institute for health visitors and school nurses, or the certificate or diploma of the National Health Society, or of any other body which may, from time to time, be approved by the Local Government Board ; or

(*e*). Have discharged, in the service of a Sanitary Authority, or of the Council of a Borough or of another Urban District or of any other public body or authority in England or Wales, duties which, in the opinion of the Local Government Board, are similar to those described in the present Act, or prescribed by the regulations made thereunder, in relation to the office of health visitor, and be able to produce such evidence as, in the opinion of the Board, suffices to prove her competency.

Persons who do not possess any such qualifications, but who have a competent knowledge and experience of the theory and practice of nurture, care, and management of young children, of attendance

on women in and immediately after childbirth, and of nursing attendance in cases of sickness and other mental and bodily infirmity, may, where in the opinion of the Local Government Board the circumstances so require, be appointed with the consent of the Board, and subject to any conditions which they may impose. Half the salary of health visitors may be paid out of the County fund and charged to the Exchequer contribution account, but the salary must be approved by the Local Government Board, and should not be less than £100 per annum, with or without an extra allowance in respect of clothing (uniform).

Since the Notification of Births Act, 1907, came into force, health visitors have become a necessity in all districts wherein the Act has been adopted, or made compulsory by order of the Local Government Board, for the visiting and re-visiting of houses wherein newly-born infants have been notified. The main object of this visiting and re-visiting is to see that the infant is, if possible, naturally or breast fed, or, failing that, is properly artificially fed. The ignorance on the subject of infant feeding and management is well known, and this ignorance is not limited to the mothers. To lessen this ignorance is the duty of a health visitor, and as this ignorance disappears, so will the infantile mortality, such as we know it to-day. London is to be congratulated upon having a Health Visitors Order which will be the envy of all extra metropolitan districts.

On Jan. 1st, 1910, the Notification of Births Act became compulsory throughout the Metropolis by order of the Local Government Board.

MIDWIVES ACT.

The Departmental Committee on the Midwives Act have issued their Report during 1909, expressing generally satisfaction with the working of the Act of 1902, and with the extent to which it has fulfilled the objects aimed at.

The enrolment, without examination, of practising and previously certificated midwives, ceased on March 31st, 1905, and uncertified women, except under medical supervision or in cases of emergency, will be prohibited from practising their calling, "habitually and for gain," after March 31st, 1910.

The Departmental Committee report as follows :—

1. Delegation of powers (vested in County Councils under the Act) to District Councils *not* desirable, and the power to be withdrawn, even where still exercised ;

2. Practitioners summoned by midwives, in cases of emergency, to have a secure expectation of payment of fees—the Poor Law Authorities to be responsible, with power to surcharge the patients the fees as "relief or loan" ;

3. Midwives to summon medical help in all cases of commencing contagious ophthalmia, which is to be made compulsorily notifiable under the Infectious Diseases (Notification) Acts ;

4. The powers of the Act with reference to the supply of midwives and the cost of training (such powers coming into operation on August 10th, 1910) *not* to be postponed, the shortage of midwives anticipated in 15 counties out of 50 being a question mainly of distribution ;

5. Other minor recommendations, dealing with procedure, etc.

The Departmental Committee is of opinion that, with the above improvements, the Midwives Act will prove of the greatest benefit in lessening and preventing not only puerperal fever and other diseases to

which lying-in women are liable, but also infantile mortality in the very early days of existence. The old order of " midwife " becomes a thing of the past, and her place is taken by an educated and certificated midwifery nurse, under constant supervision of the supervising authority or local committee.

MILK-BORNE SCARLET FEVER AND PASTEURIZATION.

A milk-borne scarlet fever epidemic occurred during June, 1909, in Kingston (Surrey) and surrounding districts, e.g., Worcester Park, Malden, Wimbledon, Wandsworth, Chelsea, Croydon, Lambeth, and Westminster, and was traced to an infected farm in a county many miles away. There were upwards of 400 persons attacked, and the symptoms were indistinguishable from ordinary average cases of scarlet fever, adults as well as children being infected. Vomiting was a not uncommon initial symptom, whilst intestinal disturbances were rare. On the whole, the type was mild. Infection from person to person was uncommon, and the Croydon figures in this respect are noteworthy, viz.: 28 patients in 24 houses, wherein there were 100 total inhabitants (exclusive of the 28 notified), and of these 100 inhabitants, 17 are stated to have previously had scarlet fever and 73 not (no information as to the remaining 10). The age-periods of the 100 inhabitants were: 0–5, 11; 5–10, 10; 10–15, 8; 15–20, 6; 20 and upwards, 65.

The epidemic was traced to infection at the farm from a newly-calved cow, affected with a disease which caused eruptions of the teats and udder. Other cows on the same farm were affected with the same disease, which appeared to be similar to the so-called " Hendon Disease," reported on by Dr. (now Sir) William Power, F.R.S., in 1885. A particular streptococcus was isolated from the cows' eruptions, and was regarded as either the *Streptococcus anginosus* (Andrewes and Horder) or the *Streptococcus mastitidis* (Savage). The precise nature of the relationship of the streptococcus to scarlet fever is not stated, and so remains an open one; though there is no doubt that the streptococcus stands in the closest biological association with the disease. The cows' scabs and excoriations were, in the main, limited to the teats, though, in one or two instances, they extended to the udder. There was no evidence of loss of hair in patches. In no instances had sores developed on the hands of milkers, who also stated that they had failed to notice any " ropy " milk. There was no evidence of the milk being infected from a human source.

Part of the infected milk appeared to be supplied to a public institution, wherein there were, at the time, about 300 inmates (surgical and medical patients, with a large number of invalid children) and a nursing staff of 30. Of the nursing staff, 6 were notified as suffering from scarlet fever—5 nurses and a kitchen maid (in attendance upon the nurses), whilst no case was notified amongst the patients. This outbreak in the institution would probably have been more widespread, had it not been for the fact that all milk used at the institution was pasteurized before use, except such milk as was to be used for cooking purposes. How was it that the nurses alone were affected? The nursing staff occupies the Nurses' Home, away from the rest of the institution, and on enquiry it was found that the milk used by the nursing staff was *not* pasteurized, although that fact was not known to the management at the time. The facts are unique as showing

the value of the pasteurization or sterilization of all milk prior to consumption, thereby killing all infectious germs which are liable to gain entrance into, and to grow rapidly in, such a medium as milk, the germs being derived from both human and animal sources. The nurses (using raw milk) contracted the disease (6 cases), whilst the patients (using pasteurized milk) escaped entirely.

POOR LAW REFORM.

The Reports of the Royal Commission on Poor Law have been issued, and much discussion has arisen around them. There is a Majority and a Minority Report. The former (i e., the Majority) Report favours the continuance of an *ad hoc* Authority on an altered basis, with a co-opted element and enlarged areas of administration. The latter (i.e., the Minority) Report recommends the break-up of the present Poor Law system with all its associations, and the transference of the functions exercised by the Parochial Authorities to other existing bodies, e.g., the sick, to the Public Health ; the children, to the Educational ; the aged, to the Pensions ; etc. Both Reports agree in condemning the present system of Poor-Law administration, and demanding its replacement, so that some action will have to be taken by Parliament. The Majority Report is signed by the chairman (Lord George Hamilton) and thirteen Commissioners, and the Minority Report by four Commissioners. The enquiry extended over three years.

In the Majority Report the unit of administration is to be the County and the County Borough, of which a Statutory Committee is to be formed, and of this Committee one-half is to be appointed from outside, i.e., co-opted members. This Committee is to be known as the Public Assistance Authority, but is not to be subject to the control of the Council of the County or County Borough. Local Committees are also to be formed, to be known as Public Assistance Committees, and to be appointed by the County or Borough Authority. The Central Authority is to remain, as at present, the Local Government Board, or a special department of the Board, to be called the Department of Public Assistance, with a Secretary of State at its head, and an increased audit staff and inspectorate.

The importance of women serving on the local committees is recognized by the Commissioners.

For medical relief purposes, it is suggested that a County Medical Assistance Committee be appointed, consisting of representatives of the Health Committee of the County or Borough Council, of the British Medical Association, of local hospitals and of friendly societies, with the formation of local committees. Other matters dealt with are : (*a*) Unemployment and the provision of a national system of labour exchanges, insurance, etc. ; (*b*) Indoor and outdoor relief ; (*c*) " Ins and outs," the aged, children, etc. ; (*d*) The able-bodied, etc.

The Minority Report suggests the break-up entirely of the existing Poor Law system and administration, and the transference of its functions to existing authorities, with the establishment of (1) a separately organized and self-contained Public Health Department, which may be part of the Local Government Board, and (2) a Ministry of Labour, with labour exchanges, insurance, etc.

PRESERVATIVES IN CREAM.

Dr. J. M. Hamill, of the L.G.B. Food Department, has during the year been experimenting with the use of preservatives in cream, such preservatives being added with the object of delaying the onset of sourness. The 1901 Departmental Committee on Preservatives and Colouring Matters in Food recommended that boric acid, or mixtures of boric acid and borax, should be the only preservative permitted in cream, and that to a *maximum* amount of 0·25 per cent expressed as boric acid, the vessels containing the boracicized cream being labelled with the amount of the preservative used.

From experiments carried out in Germany, America, and elsewhere, it appears that boron preservatives may produce a variety of symptoms and disturbances of health, due to an irritative action upon the alimentary tract, with symptoms of headache, malaise, abdominal irritation, and even (at times) vomiting and diarrhœa. Skin eruptions may also follow the ingestion of boron preservatives, and even impairment of the excretory functions, e.g., kidneys, etc., together with disturbances of metabolism and loss of weight. Personal idiosyncrasy must not be forgotten.

The boron preservative used in cream is a mixture of boric acid and borax, which mixture is first heated to expel the water, and afterwards reduced to a powder, together with (at times) the addition of saccharin or cane sugar. Sodium salicylate or sodium benzoate are sometimes used in addition to the boron preservatives. Recent experiments prove that to keep cream " sweet and saleable " for more than three or four days at 71° F., 0·2 and 0·3 per cent of boron preservative are insufficient, but that 0·4 per cent is sufficient. Compulsory labelling of all boracicized cream jars and receptacles is necessary, more especially in view of the fact that some traders supply cream guaranteed free from preservatives.

It is suggested in the Report that the use of hydrogen peroxide should be permitted as an addition to cream, provided that only traces were allowed to remain in the cream.

SECOND INTERNATIONAL FOOD CONGRESS.

During 1909, the Second International Food Congress was held in Paris, and dealt with the various operations to be recognized in the manufacture of alimentary substances, e.g. : (1) Drinks, including wine, liqueurs, cider, beer, syrups, and vinegar ; (2) Bakery products, including flour, bread, and pastry ; (3) Confectionery, including sugar, honey, cocoa, and chocolate ; (4) Grocery and spices, including tea, coffee, mustard, and salt ; (5) Dairy produce, including milk, cream, condensed milk, butter, cheese, and eggs ; (6) Meat, including meat, bacon, sausages, preserved fruits and vegetables, oils and edible fats ; (7) Drugs, including essential oils, chemical products, mineral waters, and ice.

The various sophistications of foods were much discussed, and suggestions made to limit, as far as possible, such sophistications, with the following (agreed to) results, as reported by Dr. Douglas, the Honorary Secretary, in the *Sanitary Record* :—

(*a*) Wine—to be pure, it must be the complete, or incomplete, fermentation of the juice of the fresh grape, though the addition of foreign substances, e.g., sulphurous acid and pure alcohol (derived from malt) are to be allowed.

(*b*) Cocoa and chocolate—the use of alkali in cocoa manufacture to be tolerated, on condition that the matter be referred to an International Commission.

(*c*) Dairy produce—"boron preservatives" to be allowed (as necessary) in the manufacture of butter and not to be declared, and the standard of water in butter to be raised from 16 to 18 per cent; whilst milk is to be the product solely of a healthy cow, and is to be considered "pure" only when it does not contain any colostrum or any added matter whatever, and is free from any fat subtraction—pasteurization, filtration, and refrigeration being deemed regular operations, but sterilization, creaming, and homogenizing facultative operations, to be announced at time of sale.

(*d*) Sausages—declaration at time of sale to be made when the ingredients added (e.g., bread or similar farinaceous substance) contain more moisture than the principal meat ingredient.

(*e*) Confectionery—the use of certain defined aniline colours (about 20 in number) to be allowed.

(*f*) Ice (for alimentary use)—if manufactured, to be manufactured from sterilized or town's water, and, if natural, to be obtained from a pure source, and afterwards handled under such conditions as to prevent any exterior contamination, and to be under permanent sanitary control.

(*g*) Coffee—to be the product of the coffee bean without the addition of any foreign matter (chicory or other) or the extraction of any of the caffeine.

(*h*) Preserved fruits—sulphurous acid to be regarded as a necessary addition.

SEWAGE DISPOSAL.

The value of slate beds in the primary treatment of crude sewage has been emphasized during 1909, such slate beds acting as contact beds and not as settling or septic tanks. The sludge is digested and converted into what Mr. W. J. Dibdin, F.I.C., calls "humus," which possesses a strong seaweed, but not offensive, odour. The slate beds consist of superimposed layers of slates, separated at convenient distances (about 1 inch to 3 inches) by means of slate blocks, thus forming an indestructible series of shelves, on which the sewage suspended matters are deposited when the beds are filled with sewage. The sewage is allowed to remain quiescent for two hours, when the outlet valve is opened, and the "primary effluent" run off, for further treatment on land, contact beds or sprinkler beds, etc., or for direct discharge into tidal estuaries, the sea, etc. The action of the slate beds is mechanical and biological, and the system is economical and efficacious for the treatment of solid matters in sewage. The slate beds must be used in combination with fine contact beds to obtain the maximum benefits. The deposit on the slates is débris, and not sludge in the ordinary acceptation of the word, and is inoffensive. On closer examination, it is found to consist of indigestible débris and fine earthy matter, together with minute worms (aerobic organisms) and their casts, and other living organisms of great complexity and variety, varying from the lowest type of bacteria up to more highly organized animals, all of which feed upon the waste organic matters of the sewage

The Sixth Report of the Royal Commission on Sewage Disposal has been published during 1909, and deals with the important question of the purification of distillery waste and a suggested standard of effluent. The conclusions arrived at by the Commissioners are as follow:—

(*a*). The practicability of treating the waste liquids from distilleries, either on land or on filters, so as to produce a satisfactory effluent.

(*b*). The necessity of diluting the waste liquids, and treating them with lime before filtering, preferably through percolating filters.

(*c*). Pot ale should be destroyed by heat, or it may be evaporated, and the syrup produced incinerated, thereby producing a marketable manure.

(*d*). A suggested standard effluent should be non-putrescible on incubation, should contain not more than 3 parts per 100,000 of suspended matter, and, after filtration through filter paper, should not absorb more than 1·5 parts by weight per 100,000 of dissolved or atmospheric oxygen in five days. Pot ale is of value to grass lands, if properly applied, e.g., by equal distribution, and after the solids have first settled out—the solids (yeast cells, etc.) killing the young grass shoots. Land treatment can, therefore, be used with advantage for the purification of pot ale, as also the " heat destruction " mentioned above.

On the subject of general sewage disposal, all are agreed that some form of preliminary treatment is desirable, e.g., sedimentation, chemical precipitation, septic tanks, etc., the exact form of preliminary treatment to depend upon local circumstances and requirements.

STORAGE OF RIVER WATER.

An important Report has been presented during 1909 to the Metropolitan Water Board by Dr. A. C. Houston, dealing with the storage of raw river water previous to filtration—such storage, if sufficiently prolonged, (1) reducing enormously the number of bacteria of all sorts ; (2) devitalizing the microbes of water-borne disease, e.g., typhoid bacillus and cholera vibrio ; (3) reducing the amount of oxygen absorbed from permanganate, and the amount of suspended matter ; (4) lengthening the life of the filters ; (5) reducing the amount of colour, the hardness, the amount of ammoniacal nitrogen, and (at times) the amount of the albuminoid nitrogen, etc.

In regard to the reduction of bacteria, it was noticed experimentally that both those capable of growing on agar at blood heat, and those capable of growing in a bile-salt medium at blood heat, chiefly excremental bacteria, were affected, whilst the typical bacilli coli were reduced to a proportionately greater extent than others.

The conclusion arrived at is that an adequately stored water is to be regarded as a " safe " water, and the " safety change," which has occurred in a stored water, can be recognized by appropriate tests, so that the use of stored water enables a *constant* check to be maintained on the safety of a river water antecedent to and irrespective of filtration, and, consequently, renders any accidental breakdown in the filtering arrangements much less serious than might otherwise be the case. The length of storage should be thirty days, but whether as a *maximum* or a *minimum* basis is not stated.

LEGAL DECISIONS

AFFECTING MEDICAL MEN AND THE PUBLIC HEALTH.

By JOSEPH PRIESTLEY, B.A., M.D., D.P.H.,
Medical Officer of Health, Metropolitan Borough of Lambeth.

ADULTERATION OF FOOD AND DRUGS.

LEWIS *v.* WEATHERITT (King's Bench Division).

Sale of Food and Drugs Act, 1875, s. 25—*Milk—Warranty—Verbal contract—Written warranty attached to churn in form of label.*

A sample of milk was found to be adulterated with 14 per cent abstracted milk fat, and a warranty was claimed on the following facts: A written contract existed for a fixed period, and, this contract having come to an end, the seller continued to rely upon the fact that each churn was still labelled with the names of the seller and the purchaser and the words "pure new milk." The Magistrates refused to convict, holding that there was no satisfactory warranty under Section 25 of the Act, and there was an appeal (a case being stated).

Held, that the Magistrates' decision was wrong, and that the labelled churns constituted a warranty under Section 25 of the Food and Drugs Act, 1875. *Appeal allowed.*

FRENCH *v.* CARD (King's Bench Division).

Sale of Food and Drugs Act, 1875, s. 17, *and Sale of Food and Drugs Act*, 1899, s. 11—*Refusal to sell skimmed milk to Inspector—Requirements of label.*

A milkman was summoned for refusing to sell milk to an inspector from his can during his rounds. The Inspector asked for new milk from a particular can and the milkman thereupon upset all the milk from this can into the road, stating at the time that it was skimmed milk for customers. The can did not bear any label or mark stating that it contained skimmed milk. The Magistrates convicted, but, on appeal (a case being stated), it was *held*, that the can did not require to be labelled "skimmed milk," as Section 11 of the Sale of Food and Drugs Act, 1899, does not apply to milk carried round for sale in an ordinary can, but only to condensed milk, and that, as there was no evidence that the milk was exposed for sale as new milk, the vendor could not be convicted. *Appeal allowed and conviction quashed.*

BREAD.

BAILEY *v.* BARSBY (King's Bench Division).

Bread Act, 1836, s. 4—*Sale by weight—Exception of "fancy" bread—Definition.*

Held, that bread may be "fancy" bread within the meaning of the Act, even though it is of the same quality as ordinary household bread, if it is not similar to such bread in the size, shape, and appearance of

its loaves, but of a fancy shape, so that a purchaser ignorant of the baking trade would not be deceived into thinking it ordinary household bread which must be sold by weight. *Appeal dismissed.*

COMPENSATION.

MURPHY *v.* ENNISCORTY GUARDIANS (Court of Appeal, Ireland).

Workmen's Compensation Act, 1906, s. 13—*Dispensary Medical Officer not a "Workman" as defined in the Act.*

A dispensary medical officer (Enniscorty Union) sustained an accident, from which he afterwards died, in the execution of his duties, and an application was made for compensation by his widow under the Workmen's Compensation Act, 1906.

Held, that a dispensary medical officer does not enter into a "contract of service" with the Guardians within the meaning of the definition of "workman" in Section 13 of the Act, viz., "manual labour, clerical work, or otherwise," and that, therefore, he is not a "workman" to whom the Act applies. *Appeal allowed.*

BYLES *v.* POOL AND ANOTHER (County Court).

Workmen's Compensation Act, 1906—*Workmen in receipt of Poor Law Relief at time of accident.*

Held, that the Poor Law Relief must be taken into account in fixing the amount of compensation to be awarded under the Workmen's Compensation Act, 1906. *Decision accordingly.*

PORTON *v.* CENTRAL (UNEMPLOYED) BODY FOR LONDON (Court of Appeal).

Workmen's Compensation Act, 1906, ss. 1, 13—*Temporary work is a contract of service under the Act.*

Held, that a workman employed temporarily by the Central (Unemployed) Body for London is a "workman" under a contract of service within the meaning of the Workmen's Compensation Act, 1906, and that, therefore, on death by accident in the course of his employment, his widow is entitled to compensation. *Appeal dismissed.*

MULROONEY *v.* TODD (Court of Appeal).

Workman's Compensation Act, 1906, ss. 4 (1), 13—*A Municipal Corporation contracting for work to be done by a Contractor is liable under the Act for Compensation as Principals.*

Held, that the contract between the Municipal Corporation and the contractor was a contract for the execution of work undertaken by the Corporation, under their powers and duties as such, and that, therefore, the Corporation was liable as principals under Section 4 (1) of the Act for compensation. *Appeal dismissed.*

JANE HARVEY (since deceased) *v.* LONDON COUNTY COUNCIL (Chancery Division).

Housing of the Working Classes Acts, 1890—1903—*Unhealthy area and improvement scheme—Business premises outside the area affected*

with loss of trade and diminution of the value of the goodwill of the business carried on—Evidence not admissible.

The London County Council, in carrying out an improvement scheme under the Housing Acts, partially extinguished an easement of light in connection with premises outside the area. The owner claimed compensation under Section 22 of the Housing Act, 1890, and the matter went to arbitration, but a case was stated for the High Court under Section 19 of the Arbitration Act, 1889.

Held, that, in determining the amount of compensation under the Housing of the Working Classes Act, evidence of the loss of trade and diminution in the value of the goodwill of the business carried on at premises (outside the condemned area) was not admissible.

Order made accordingly.

CORONER'S INQUEST.

REX *v.* WOOD—*Ex parte* ATCHERLEY (King's Bench Division).

Coroners Act, 1887, s. 6 (1)—*Order for Second Inquest on further evidence being submitted.*

The body of a girl was found in a pigsty in a burned and charred condition. An inquest was held (without post-mortem examination) on the same day that the body was found, and, after hearing the evidence of two witnesses (neither being medical), the jury returned an open verdict. Foul play was afterwards suspected, and the Jury wished to alter their verdict. The body was exhumed by order of the Home Secretary.

Held, that a second inquest must be held, the first verdict of the Jury being quashed. *Order made accordingly.*

DENTISTS AS UNREGISTERED PRACTITIONERS.

BELLERBY *v.* HEYWORTH (Appeal Court).

Dentists Act, 1878, s. 3, *and Medical Act*, 1886, s. 26—*Unregistered Practitioner.*

A firm, the members of which were not registered dentists under the Dentists Act, 1878, nor legally qualified medical practitioners under the Medical Act, 1886, practised dentistry, affixing to their premises a notice to the following effect: "Finest artificial teeth. Painless extraction. Advice free," One of the firm objected on the ground that such a notice was a contravention of section 3 of the Dentists Act, 1878, and endeavoured on that account to put an end to the partnership, by giving the due notice in writing as required under Clause 10 of the articles of partnership. The notice was *held* by Mr. Justice Parker to be in order, and the partnership, therefore, was dissolved. On appeal, it was *held*, that an unregistered person could announce that he did dental work, provided he did not say he did so as a dentist, or use any description of himself implying that he was specially qualified to practise as a dentist. *Appeal allowed.*

DRAINAGE.

LORDEN *v.* WESTMINSTER CORPORATION (King's Bench Division).

Metropolis Management Act, 1855, ss. 73, 74, 76—*Ventilation of*

Drains under By-laws requiring two Untrapped Openings—Additional vent pipe—Plan submitted.

By-law 8 of the By-laws made by the London Council under Section 202 of the Metropolis Management Act, 1855, requires, for new buildings, the provision of at least two untrapped openings to a drain for ventilation. The premises in dispute were drained by a combined system, and the Sanitary Authority approved of the plan, subject to an additional vent-pipe being provided. To this requirement the owner objected, on the ground that the By-laws required only two untrapped openings for ventilation. The magistrate convicted on the ground that there had been contravention of the By-laws, and the defendant appealed, the Magistrate stating a case.

Held, that the appellant had, in fact, provided the two untrapped openings required by the By-laws, and that the appeal on that heading must be dismissed; but that the respondents had power to require, by their order, the provision of the additional vent-pipe, and that the appeal on that heading must be allowed. *Decision accordingly.*

KERSHAW *v.* BROOKS (King's Bench Division).

Metropolis Management Act, 1855, ss. 76, 202—*Local Government Act*, 1888, s. 40 (8)—*Drainage and the Depositing of Plans under By-laws—Liability of person doing the work.*

The Hampstead Borough Council summoned a builder for not carrying out sanitary work in accordance with the By-laws, and for not depositing plans in accordance with the By-laws. The Magistrate dismissed the summons on the ground that the owner was the person who ordered the work to be done, and who was, therefore, responsible, and not the builder. Against this decision an appeal was lodged (the Magistrate stating a case).

Held, that the Magistrate's decision was right, there being nothing to show but that the builder was merely carrying out the orders given him by the owner, and could not, therefore, be convicted for a breach of the By-laws. *Appeal dismissed.*

HORNSEY CORPORATION *v.* KERSHAW (Quarter Sessions).

Public Health Acts Amendment Act, 1890, ss. 7, 19, *and the Public Health Act*, 1875, s. 41—*Work done by Local Authority after notice—Expenses apportioned—Recovery—Appeal to Quarter Sessions—Combined Drain.*

Notices were served by the Hornsey Corporation undsr Section 41 of the Public Health Act, 1875, and Section 19 of the Public Health Acts Amendment Act, 1890, upon the owners concerned to remedy a defective combined drain. The local authority carried out the work in default, and apportioned the expenses. One owner refused to pay his share, and a summons was taken out, but was dismissed by the Magistrates on the ground that the notice was invalid, being unreasonable. On appeal, it was *held*, that the notice was an invalid one, being unreasonable, in that it called upon the owners to repair the whole of the drainage (combined), which was proved defective, within seven days (too short a time); and, further, that there was an

appeal to Quarter Sessions under Section 7 of the Public Health Acts Amendment Act, 1890, even though no order had been made, but the complaint simply dismissed. *Appeal dismissed.*

PEGG & JONES LIMITED *v.* DERBY CORPORATION (King's Bench Division).

Public Health Act, 1875, ss. 42–44—*Derby Improvements Act*, 1879, s. 67—*Cleansing of Privies—Definition of reasonable excuse for not cleansing.*

A local authority was summoned for not cleansing the privies of a factory, the authority refusing to do so on the ground that the privies had not been approved by them.

Held, that the local authority had no power to refuse to cleanse the privies on the ground stated, the excuse not being reasonable.

Appeal allowed.

FACTORIES AND WORKSHOPS.

VERNEY *v.* MARK FLETCHER & SONS, LIMITED (King's Bench Division).

Factory and Workshop Act, 1901, ss. 10, 17, 135, 146—*Fencing in of Machinery—Continuing Offence—Time Limit for Proceedings. Under Summary Jurisdiction Act*, 1857, s. 2, *Notice of Appeal must be given.*

A Factory Inspector found a flywheel not securely fenced in on July 1st, 1908. He had found the same infringement of the Factory Act on March 12th, 1908. A summons was taken out on July 22nd, 1908. Section 146 of the Factory and Workshop Act, 1901, enacts that the information shall be laid within three months after the date at which the offence comes to the knowledge of the Inspector, and the Magistrates, in consequence, dismissed the summons. On appeal, it was *held*, that the offence was a continuing offence, and that the second visit of the Inspector on July 1st, 1908, may be taken as the time when the offence came to the knowledge of the Inspector, and that the proceedings were, in consequence, within the time fixed by the Section.

It was further *held*, that the court has no jurisdiction to hear an appeal from Justices by case stated, unless the requirements of Section 2 of the Summary Jurisdiction Act, 1857, have been complied with, viz., due notice given. *Appeal allowed and case remitted.*

PATTERSON *v.* HUNT (King's Bench Division).

Factory and Workshop Act, 1901, s. 149—*Sorting of Rags by hand—Definition of Factory.*

The occupier of premises used for hand-sorting of rags, which had been, in some cases, dusted by a shaker driven by an electric motor, employed persons under sixteen years of age without obtaining certificates of fitness. He was summoned before the Magistrate, who dismissed the case. On appeal (the Magistrate stating a case), it was *held*, that rag sorting by hand does not constitute a manufacturing process, and that, consequently, the premises were not a "factory" within the meaning of Section 149 of the Factory and Workshop Act, 1901. *Appeal dismissed.*

HOSPITAL TREATMENT.

HILLYER *v.* LONDON CORPORATION (Appeal Court).

Hospital—Personal Injury to Patient during treatment—Negligence of Professional Staff.

During examination of a patient under anæsthetics, his left arm got burned by a hot-water tin, and his right arm bruised by pressure. Traumatic neuritis and paralysis of both arms resulted. The examination was made gratuitously. The plaintiff entered an action in the High Court against the hospital authority, and the judge gave judgment for the defendants. An appeal was lodged, and it was *held*, that a hospital authority is not liable in damages to a non-paying patient for the negligence of its professional staff in matters of professional skill, provided that it has used reasonable care in selecting a competent staff, and has furnished the staff with proper apparatus and appliances. *Appeal dismissed.*

HOUSES LET IN LODGINGS.

ARLIDGE *v.* ISLINGTON BOROUGH COUNCIL (King's Bench Division).

Public Health (London) Act, 1891, s. 94—*Houses let in Lodgings—Landlord to cleanse under By-laws.*

A By-law was made requiring the landlord of a lodging-house to cleanse once in every year, the definition of "landlord" being the "person for the time being receiving the rack rent of the lodging-house, whether on his own account or as agent or trustee for any other person, or who would so receive the same, if such premises were let at a rack-rent." A summons was taken out by the Islington Borough Council against the landlord, who had sublet the premises to a quarterly tenant, and the magistrate convicted. An appeal was lodged (a case being stated), and it was *held*, that the By-law was unreasonable, and therefore void, as it cast upon landlords an obligation which they might not be able to obey without committing a breach of contract or a trespass. *Appeal allowed.*

NEW BUILDINGS.

HANRAHAN *v.* LEIGH-ON-SEA URBAN COUNCIL (King's Bench Division).

Public Health Act, 1875, ss. 157 (2), 158, 159—*Conversion of Railway Carriage into a Dwelling House as a new Building, to which the By-laws apply.*

A railway carriage was altered so as to be used as a dwelling house, the seats of the carriage being removed, a partition opened up so as to allow of things being handed through, a stove and chimney provided, and a shed (with earth closet) built near to, etc.

Held, that by Section 159 of the Public Health Act, 1875, a new building had been erected, and that the By-laws made in regard to new buildings under Section 157 (2), therefore, applied. *Appeal dismissed.*

N.B.—On appeal to the Appeal Court, the decision of the King's Bench Divisional Court was affirmed, and the appeal, consequently, dismissed.

REFUSE REMOVAL.

LYONS & CO. LIMITED *v.* CITY OF LONDON CORPORATION (King's Bench Division).

Public Health (London) Act, 1891, ss. 30, 141—*Meaning of House Refuse—Duty of Local Authority to remove.*

The refuse from a tea-shop consisted of ashes and clinkers, coffee grounds, newspapers, cabbage leaves, egg-shells, dust and general dirt, broken crockery, tea leaves, potato parings, scrapings from the sink, and sweepings from rooms. It did not include scraps left by customers, which were given away in charity. No one slept on the premises at night.

The Magistrate decided that the refuse was not house refuse, and on appeal it was *held*, that the refuse was house refuse, and not trade refuse within the meaning of ss. 30 and 141 of the Public Health (London) Act, 1891, and that therefore the Sanitary Authority were under an obligation to secure its removal *Appeal allowed.*

RIVER POLLUTION.

HAGUE *v.* DONCASTER RURAL DISTRICT COUNCIL (King's Bench Division).

Public Authorities Protection Act, 1893, s. 1—*Six months Statute Limit not applicable in case of Death from drinking Polluted Stream, there being a continuance of injury or damage.*

The plaintiff (a farmer) watered his cattle at a stream passing alongside his premises. The stream was continuously polluted for two years and over, and as a result three of the plaintiff's bullocks died—the last one over six months before the date of the action. Judgment was given for the plaintiff by the County Court, and the defendants appealed on the ground that the Public Authorities Protection Act, 1893, Section 1, states that " the action shall not lie unless commenced within six months next after the neglect, act, or default complained of, or, in case of a continuance of injury or damage, within six months next after the ceasing thereof."

Held, that the pollution of a stream is a continuance of injury or damage within he meaning of Section 1 of the Act, and that, therefore, the first portion of the Act does not apply. *Appeal dismissed.*

BROOK LIMITED *v.* MELTHAM URBAN DISTRICT COUNCIL (House of Lords).

Rivers Pollution Prevention Act, 1876, s. 7—*Bacterial Filter Beds not " Sewers."*

Held, that the decision of the Appeal Court be affirmed, and the appeal dismissed (*See Medical Annual*, 1909, page 657).

BUTTERWORTH & ROBERTS *v.* WEST RIDING OF YORKSHIRE RIVERS BOARD (House of Lords).

Rivers Pollution Prevention Act, 1876, ss. 3, 4, 7, 10—*Manufacturing Refuse sent into a stream through a sewer—Liability of Manufacturer.*

This was an appeal to the House of Lords from the decision of the

Appeal Court, which held that a person sending polluting liquid from a manufactory through a sewer into a stream, commits an offence under Section 4 of the Act, whether or not the Sanitary Authority, owning the sewer, has afforded such person facilities for so draining his manufactory into the sewer—the same decision as was given by the High Court (*See Medical Annual*, 1909, page 658).

Held, that the decision of the Appeal Court was correct and must be upheld. *Appeal dismissed.*

THAMES CONSERVATORS *v.* GRAVESEND CORPORATION (King's Bench Division).

Thames Conservancy Act, 1894, s. 94—*Sewage into River—Liability of Sanitary Authority for Sewage from their own premises.*

The Gravesend Corporation were summoned by the Thames Conservancy Board for failing to comply with a notice to discontinue the flow of sewage from their sewers into the River Thames. The sewers took the drainage of the Corporation's Town Hall and other public buildings, and had done so for the last twenty years (with the exception of some new police cells). The Magistrates refused to convict, and, on appeal (a case being stated), it was *held*, that, as the sewage originated on the p emises of the respondents themselves (i.e., the Corporation), they were not exempt from liability to conviction. *Appeal allowed.*

THE EDITOR'S TABLE.

In this section we endeavour to bring before our readers the work that is being done by inventors and the manufacturers on their behalf. May we emphasize our desire that samples, together with descriptions and small illustrations (if necessary), should reach us by NOVEMBER. We experience some difficulty in obtaining compliance with this necessary condition, and trust that our friends will recognize its importance.

In respect to Pharmaceutical Products and Dietetic Articles, we are always ready when a sufficient quantity is sent to us *early in the year*, to arrange for it to be tested in Hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires. We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the *Medical Annual* has come to be valued.

MEDICAL AND SURGICAL APPLIANCES.

Ambulance Case.—Messrs. Reynolds & Branson, Ltd., send us a circular-plated case which can be carried in the waistcoat pocket, and which contains many things useful for first-aid, such as friar's balsam, plaster, boric lint compress, protective bandage, and antiseptic tablets (*Fig.* 109). It is just the thing to carry in one's travelling bag, or even knapsack. The cost is 1/9.

Fig. 109.

Antiseptic Air Producer.—This appliance consists of a vessel capable of holding a quart of water, with which phenol or other antiseptic is mixed, say, in the proportion of 2 per cent. When heat is applied by means of the spirit lamp, a jet of superheated steam is delivered which passes through a tube containing apertures for the admission of air, so that when delivered its volume is increased and the temperature lowered, making it cool enough to be inhaled with comfort. It will be seen, therefore, that the apparatus gives us a means of administering inhalations in a more efficient way than any existing appliance. It gives a supply of air rather than vapour, and we can make that air so dilute that it will pass to the air-cells of the lungs without provoking irritation. We need not ask the patient to inhale, but simply charge the atmosphere of the room with the balsamic vapours that the case suggests. It is large enough to give a supply for three hours without recharging. The apparatus, is furnished with an excellent spirit lamp, a tube for directing the vapour at any angle, and a safety valve. It is quite well made and practical in every respect. Mr. S. Lee, 51, Conduit Street, London, W.

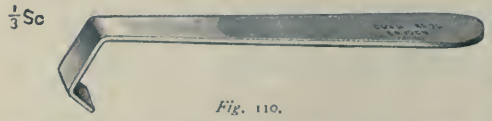

Fig. 110.

Appendicitis Retractors.—Mr. A. Z. C. Cressy, of Wallington, who considers the splitting operation in appendicitis the only justifiable one, has modified the shape of the ordinary retractor as shown in *Fig.* 110. (1) The part

introduced in the wound is always in the same plane as the muscle retracted, consequently it is not lacerated; (2) The width of the retractor is just enough to give a good field of operation without unduly stretching the external oblique; (3) The handle is laced at an angle to accommodate the assistant's fingers below, whilst the thumb lies on the upper surface. The retractors are well made by Messrs. Down Bros.

Bacteriological Test Case.—Mr. W. Martindale, of 10, New Cavendish Street, W., has put up a very complete and compact test case for the use of practitioners. It contains all the appliances, stains, and solutions necessary for any ordinary investigation. He also supplies all the bacteriological culture media, ready for use.

Mr. Martindale also undertakes all bacteriological examinations for the practitioner, who not infrequently cannot spare the time for this branch of work himself.

Balances.—In order to meet the Board of Trade new regulations, Messrs. Reynolds & Branson, Ltd., of Leeds, have produced a balance, "The Magnalium," for the dispensary, which excels anything we have seen in delicate adjustment and at a remarkably low price. The beam, standard, and pans are made of magnalium, a metal which is lighter and cleaner than brass, and less easily corroded. The scales rest upon an agate knife edge, and are extended to carry up to two ounces. There is a fine adjustment at each end of the beam. It is sensitive to 0·01 gram, and can be used in the most delicate chemical experiments. It is supplied without a case at the moderate price of

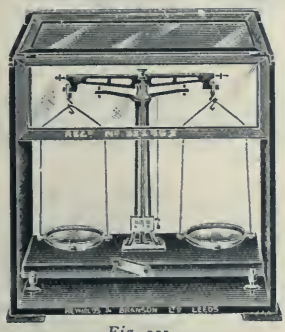

Fig. 111.

30/–, but it is better to have the case called the "Rystos" in addition (*Fig.* 111). This has a sliding door, which folds back and rests upon the top of the balance case, obviating the necessity for catches or balance weights. This costs 8/6. In conjunction with it sets of weights are also supplied in either metric or apothecaries' scale (stamped). We must congratulate Messrs. Reynolds & Branson on this production, which has received the approval of the leading pharmaceutical authorities.

Messrs. Allen & Hanburys have also produced a dispensing balance, the "*Wigmore*" (*Fig.* 112), which complies with regulations and is Government stamped. It stands on a mahogany table,

Fig. 112.

with drawer for weights, which are supplied with the balance. It is excellently made, and will meet all ordinary requirements.

Belt (The Domen Abdominal).—The "Domen" Belts Co., Ltd., 456, Strand, London, have produced a cheaper form of their belt (No. 50*a*), but it appears to have all the advantages of their well-known appliance, which is invaluable in the treatment of enteroptosis, a disorder which is much more common than is ordinarily supposed. There are a large number of cases where the symptoms are attributed to the uterus, or to "floating kidney," where the use of a single "Domen" belt to support the intestines (*Fig.* 113) will give immediate relief.

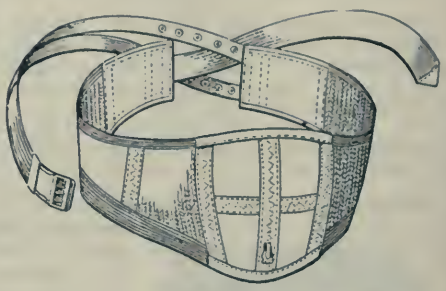

Fig. 113.

Bottle Cases.—These are metal cases with springs in the bottom into which the bottle is placed, and the cover serves to clamp down the stopper. They are very convenient when bottles have to be carried in the surgical bag, or for use in tropical climates. They are supplied by the Medical Supply Association, Gray's Inn Road, W.C.

Bottles and Jars (Glass Storage).—We have received from the Medical Supply Association, Gray s Inn Road, some bottles, wide mouthed, with glass stoppers, well suited for storage of needles and ligatures, and small dressings. Sizes 3 by 1½ inches and 3½ by 3 inches, costing 1/3 and 1/6 each. They also supply the Dillworth glass jar, which has a glass cover secured by a clamp, rendering it air-tight and its contents, if fluid, quite secure when carried in the hand-bag. Sizes 3½ by 3 inches, and 6 by 3 inches, at 8d. and 1/– each respectively. The larger sizes make an excellent receptacle for dressings, as they are then always in sight and efficiently protected.

Clinical Thermometers.—The latest production of Mr. G. H. Zeal, 82, Turnmill Street, E.C., is a non-magnifying clinical thermometer which can be so easily read that magnification is unnecessary (*Fig.* 114). His idea was to meet the objections of medical practitioners who do not like the "light

Fig 114..

flashing" of the magnified index, and also to produce a good 30-second thermometer at a moderate price. He has also made another improvement. By giving the thermometer flat sides it will not roll off the table and commit suicide on every possible occasion. Personally we are still using Mr. Zeal's "Repello" thermometer which we noticed some years ago. We thought at the time it would prove fragile, but it remains still unbroken, although we have dropped it many times. The labour of shaking down the index it has saved us during all these years is something to be thankful for. We consider that the thermometer we are noticing is the ideal one for the nurse, because it is cheap, but the practitioner should have a "Repello" for his own use.

We have received from the Medical Supply Association an ingenious arrangement for *re-setting the index* of a clinical thermometer. In practice it means carrying the equivalent of two thermometer cases joined together

by a hinge. We would suggest to those of our readers, who would not find this objectionable, to apply for particulars, as the method is quite practical.

Comedo Expressor.—We show in *Fig.* 115 a new comedo-expressor designed by Dr. J. Pernet which is rather larger than those in ordinary use. It is in the

Fig. 115.

shape of a blunt fenestrated curette, slightly bent at the end and a little over four inches long. It is excellently made by Messrs. Mayer & Meltzer, 71, Great Portland Street, W., and costs 3/6.

Covers for Vessels.—The part played by flies in conveying infection has made the protection against their invasion an important factor in checking infantile diarrhœa. Messrs. R. Sumner & Co., of Liverpool, have, at the suggestion of Dr. V. J. Glover, introduced some simple covers to go over all vessels containing milk, sugar, or other foods liable to be contaminated by flies. They are exceedingly cheap and efficient; and last summer they were extensively used. We would strongly suggest to our readers the advantage of impressing the value of this simple precaution on their patients. The same firm also produce some simple covers large enough to cover the child's cot for the same purpose.

Cupping-Glasses.—An improved set of four cupping-glasses with metal pump and four stopcocks in case, price 25/-. The above is a useful outfit for carrying out the induction of artificial hyperæmia, and is supplied by the Medical Supply Association, Gray's Inn Road, W.C.

Diagnosis Sheet.—A special sheet for ear, nose, and throat specialists has been designed by Mr. Heinemann. Samples are supplied by the Medical Supply Association, Gray's Inn Road, W.C.

Dressing Shears.—Messrs. R. Sumner & Co., of Liverpool, send us a pair of shears with serrated lower blade, which is very useful when dressings have to be cut up in quantity and the material is thick. They save time, and also the wear and tear of smaller scissors. They cost 5/- each.

Dressing Table (Aseptic).—In this table the glass plate simply rests upon the iron frame by its extreme points, but is perfectly secure. This is better than a frame, in the crevices of which dust may collect and the aseptic properties of the table be destroyed. It is well made with steel tubing, enamelled white, and is furnished with, or without, rubber wheels. It is excellently adapted to its purpose, and is not expensive. It is supplied by Messrs. R. Sumner & Co., Liverpool.

Dressings, Surgical.—*Formidine Gauze* is a new surgical dressing which possesses powerful antiseptic properties, and may be used in place of iodoform gauze, with the advantage of freedom from unpleasant odour and liability to stain. It is prepared by treating sterilized gauze with a 5 per cent suspension of formidine, a condensation product of iodine, formic aldehyde, and salicylic acid. In contact with organic alkaline secretions, formidine slowly dissolves and develops the germicidal activity of its constituents. Comparative tests on infected wounds have shown that the antiseptic power of formidine is at least as great as that of iodoform, and that it does not give rise to irritation or toxic effects. Formidine gauze is packed in sterilized glass jars provided with air-tight caps, each jar containing one square yard of the moist gauze. Messrs. Parke, Davis & Co. are the manufacturers.

Messrs. Allen & Hanburys, 48, Wigmore Street, W., are now putting up sets of sterilized dressings suitable for such operations as hernia, appendicectomy, etc., in a tin with canvas cover. These contain everything likely to be required, including caps, overalls, towels, etc. The complete set costs £3. After an operation the surgeon can return the case, and it will be refilled with everything clean and sterilized for 10s. 6d. This is not only very convenient, but it ensures that everything is thoroughly sterilized before use. It makes the work of preparing for an operation in private practice very much lighter. The "*Wigmore*" is the name given to this set of dressings. The same firm send us the "Tetra" compresses and bandage. These are made of two or four layers of soft material woven together at the edge. As they are capable of being washed a good many times, they come cheaper than gauze. They are largely used in France for this reason. The gauze compresses can be used in place of towels, sponges, or pads, and are quite nice for this purpose. The bandages are 5½ yards in length, and from 2 in. to 12 in. wide. The compresses are made from 2 in. to 20 in. square in the gauze sheets, and from 8 in. square to 39 by 59 in. in the closely woven sheets. We think this form of dressing is well worth the attention of our surgical friends.

A new white *Transparent Tissue* of soft texture has been produced to take the place of oiled silk or guttapercha tissue. It is very much superior to both, and will be appreciated by the profession. This material can be obtained from the Medical Supply Association, Gray's Inn Road, W.C.

Under the name of *Vulnoplast*, the Liverpool Lint Co. have introduced a new surgical dressing of great practicability and convenience. To dress a wound, all that is necessary is to cut off a piece of the dressing to a convenient size, remove a gauze covering from its edges, which are adhesive, and stick it on. When you have done this there is a layer of antiseptic next the wound, a layer of absorbent gauze above it, and then the outer-covering or protective. It is made in various sizes—2 yards 1½ inches wide cost 3/3. It will save a great deal of time in the dressing of wounds, and give the dressing a much neater appearance.

Drop-bottles.—While apparently this is quite a small matter, we regard the "Grevellite" drop-bottles as one of the most important advances of the year. It is a dropper such as we require for "eye drops" and many purposes, *without* the india-rubber attachment. The shape is similar, but it is all made of glass. The tube has a hole near its extremity, so that it fills itself directly it is inserted, and an open bottle will emit drops on removal when it is held in the vertical position. This appliance fills a much-needed requirement. It is supplied by the Medical Supply Association, Gray's Inn Road, W.C.

Fig. 116.

*Fig.*117.

The same firm also produces an improved chloroform drop-bottle. The stopper is so made that by turning the milled head the chloroform drop can be regulated to fast, slow, or continuous. It has an outer metal case and a graduated bottle, the contents of which are always visible.

Messrs. Reynolds & Branson, of Leeds, supply a similar drop-bottle for chloroform, in metal and outer case, and beautifully finished (*Fig.* 116). They also have a chloroform drop-bottle (*Fig.* 117) in amber glass with stopper, for 6d. It has a wide base to prevent over-turning, and is quite gas-tight when the stopper is turned round; it drops freely when the stopper is turned to the proper position. This drop-bottle would be useful for a variety of purposes.

We show in *Fig.* 118 a new stand for eye drop-bottles. It holds a dozen one-ounce bottles, which are arranged after the manner of the ordinary cruet-stand. It is devised by Mr. S. B. Gadgil, and made by Messrs. Mayer and Meltzer.

We have also received a sample of a drop-bottle (*Fig.* 119), which is all glass, on the same principle as the "Grevellite," described above, from Messrs.

Fig. 118.

Fig. 119.

R. Sumner & Co., Liverpool, which is equally adapted either for eye-solutions or acids.

Electrical and X-Ray Appliances.—We have observed with great satisfaction the efforts made by Messrs. F. Davidson & Co., of 29, Great Portland Street, W., to give us electrical apparatus for diagnostic and treatment purposes of British make. That we have lagged behind the great foreign firms is self-evident, and therefore we admire the Britisher who has had the courage to compete in the race for the practitioners' approval. We believe that no Continental firm can produce anything better than that Messrs. F. Davidson & Co. call their "No. 54 Outfit." It contains everything necessary for the examination of the eye, ear, nose, and throat, transillumination of the antrum, and cautery, and we have personally examined each of the appliances which are put together in a neat box. The illustrations give an idea of the appliances provided (*Fig.* 120, *A*, *B*, *C*, *D*, *E*, *F*).

A shows the main lighting tube with lamp and mirror attached for laryngoscopy. *B* is a funnel fitting with powerful lens, to be put on over lighting tube after the mirror has been removed. *C* and *E* show nasal and aural specula in position. *F* twin-lamp fitting for illuminating the antrum. The single sinus fitting, *D*, is placed over the single lamp in the lighting tube (*A*) for transillumination of the sclera.

It is impossible to get a more brilliant illumination of the ear, nose and throat than this combined appliance gives. Light can be placed to right or left of specula, one hand holds it and the other remains for use of a probe, etc. For illumination of the antrum, the twin-lamp fitting is inserted in the lighting tube.

This appliance may be used on accumulators or on the house current by means of the rheostat.

Special attention is worth giving to a urethroscope adapted by Mr. F. Davidson from Brüning's bronchoscope. Nothing better has been seen : the illumination being all that can be desired and the instrument perfectly finished. A cystoscope after Mr. Hurry Fenwick's pattern, equally effective but more moderate in price than usual, can be recommended. Something quite out of the common is offered by this firm for transillumination. The idea is that of Mr. Scanes Spicer. Either one or two sinuses can be illuminated at will, and either in conjunction with the antrum. The advantages

are obvious. The instrument consists of a handle to which is fitted a rheostat and control switch. From the rheostat 3 metallic flexible tubes

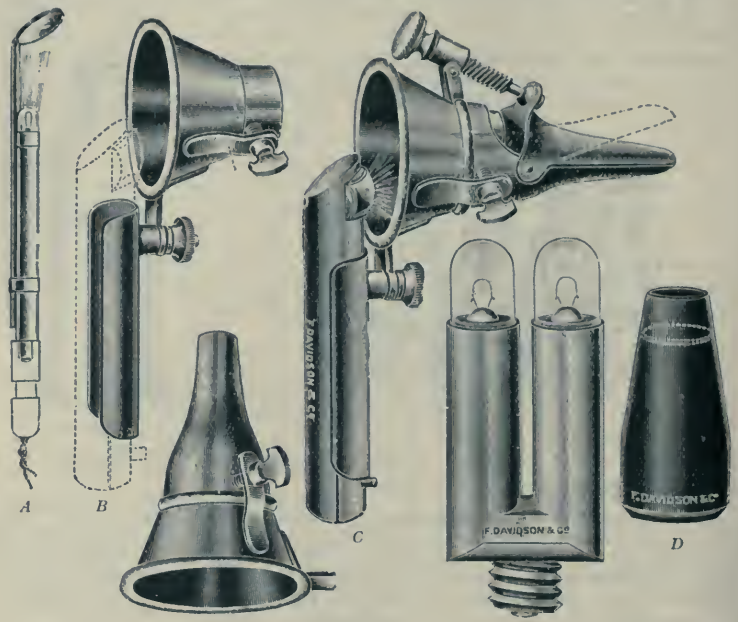

Fig. 120

run, into each of which is inserted a fitting containing two metallic filament lamps, each of 4 volts. A vulcanite casing is fitted over the lamps for illumination of the sinuses, and an aseptic casing over those for the antrum. This appliance may be used with the house current through suitable resistances. The "Portable Rheostat" shown in our advertising columns is a splendid contrivance for the purpose. It is only 6 in. long (without the lamp), and is suitable for all surgical lamps from 4 to 8 volts.

The patent self-luminous ophthalmoscope (*Fig.* 121) supplied with this set of instruments is the invention of Mr. F. Davidson. It is unique in its simple mechanism, which renders it the easiest of ophthalmoscopes to use, even for the tyro in such matters. By simply withdrawing the lamp to the fullest extent, retinoscopy can be done as with a concave mirror. By pushing it half way home, *indirect* examination can easily be made; while when *right home*, direct examination and retinoscopy as with a *plane* mirror can be done. A series of lenses similar to those in Lawford's ophthalmoscope are fixed to the back plate of the mirror. These are sufficient for all purposes. The metallic filament lamps supplied with all these instruments give very fine illumination, and the "Davon" dry batteries, also a speciality of F. Davidson and Co., possess the welcome property of not deteriorating materially if not used for some

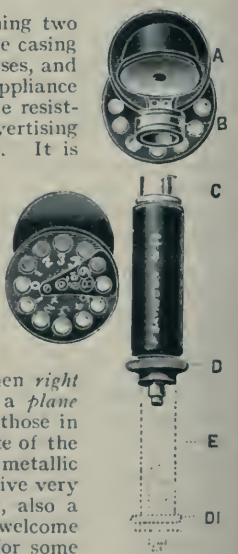

Fig. 121

time. It is a well-known fact that dry batteries of the ordinary kind exhaust themselves if not used for a month or two. The "Davon" might be put aside unused for six months, and the deterioration would not be more than 6 per cent. Another feature of this battery is its adaptability for light cautery operations, and a handle and four burners are supplied with this set. The whole outfit is contained in a mahogany box, measuring about 11 in. by 10 in. by 3 in., and is made throughout by the firm

The Medical Supply Association, of Gray's Inn Road, W.C., have a simple *transformer* by which the continuous current used for ordinary electric lighting purposes can be utilized for all medical purposes, such as electric illumination, galvanzation, faradic current, vibratory massage, centrifuge, hot-air apparatus, and hot-air douche.

The complete apparatus for any of these requirements is supplied at very moderate prices, together with the Greville-Read transformer. Thus the transformer, with throat lamp, hand piece, and resistance lamp, costs 25/–; accessories for galvanism 10/– extra; faradic coil with all accessories 25/– extra. It will be seen how very cheaply a practitioner can fit himself up with the means of employing electricity.

X-Ray Apparatus. We show here (*Fig.* 122) the latest apparatus for combining in one installation the means of giving X-ray treatment requiring small output during long periods of time, as in skin treatment, and great output for very short periods of time, as in rapid radiography. By simply turning a switch either upwards or downwards one obtains from the same installation just about the output required With the adjustable rheostat shown on the switchboard, this milliamperage can be regulated to exactitude.

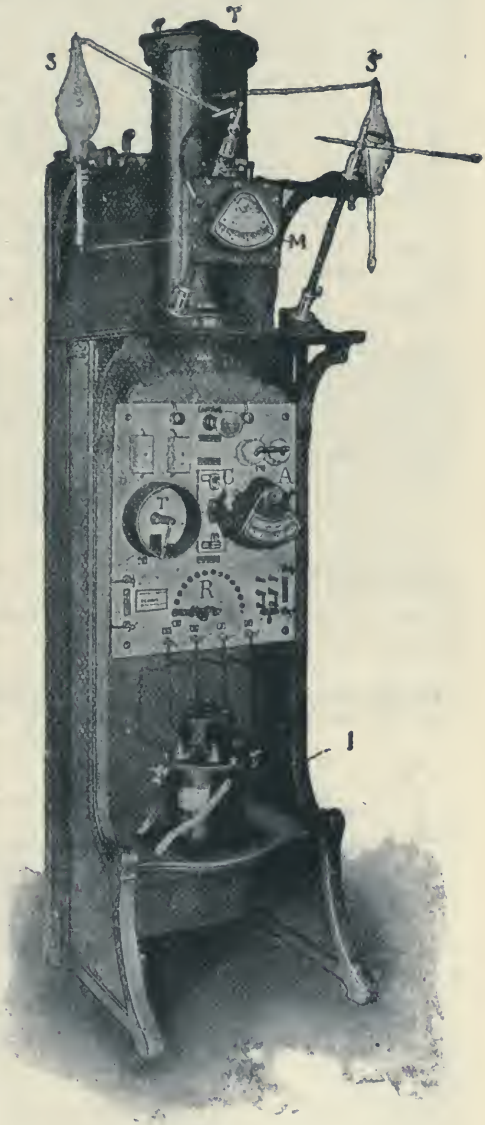

Fig. 122.

The coil is shown standing upright at the upper part of the illustration. It is entirely new in construction—the Rochefort insulation being employed to supersede the ordinary wax insulation, with the result that immense current can be used without fear of breaking down the coil. In very heavy discharges for rapid radiography, two valves are employed, in series. For ordinary work one is sufficient. To give an idea of the power, a small coil of the type illustrated, which costs £25, equals in output that of an ordinary 20 in. wax insulated coil. The larger coil, actually shown in the illustration, which costs £35, has a variable primary and gives double the output of the smaller. The interrupter works with four mercury jets in a dielectric of coal gas. It can be run for many hours during the day without giving any trouble, or requiring cleaning for months. Such installations can be used either on the continuous main current, or are specially arranged on the alternating main current. If on the alternating main, the secondary current is unidirectional, and no valve tubes are required. The advantages offered by one installation which will respond to all demands for rapid radiography and all the other requirements for radiotherapy, are self-evident. The Manufacturers are Messrs. Gaiffe, of Paris, and the agents The Medical Supply Association, W.C.

Electrical Illumination.—Mr. Canny Ryall has given great attention to the question of electric illumination, and by means of the triple filament lamp and a suitable condensing lens has secured a light which is in parallel rays and which is not deflected on the + side of the tube. The Universal handle costs £5 5s., and is specially adapted for the examination of the urethra or sigmoid, although other forms of specula can be fitted to it. The lamp requires 10 to 12 volts, and gives a brilliant light. Messrs. Allen & Hanburys are the makers, and also supply a portable accumulator, which gives up to 12 volts, for £3 15s.; or the ordinary electric light supply (with a rheostat) can be used when available.

Emergency Case (Tropical).—This is a wonderful little box, made by Messrs. Ferris & Co., of Bristol, containing all the little things likely to be required for minor accidents, and also a snake-bite outfit. There are full directions that may be of great use to the traveller. The price complete is only 2/6.

Feeding-bottle (The "Amater").—This is a decidedly novel feeding-bottle (*Fig.* 123), as it has no tube either inside or outside the bottle. The bottle is almost globular in shape, and has for its cover a piece of india-rubber with a teat in the centre. Thus it represents as nearly as possible the human breast. But, admitting the advisability of doing without the tubes, which are difficult to keep clean, we think the globular shape of the bottle will not prove most convenient in practice, though the same idea, carried out with a flatter bottle with a smaller top to cover with indiarubber, would possibly solve the problem. The idea is excellent, and we shall be glad to see it made as practical as possible. It is sold by Messrs. Lowe & Co., 8, Stafford Street, W.

Fig. 123.

Finger Guard for use as Director.—Mr. Charles P. Childe, F.R.C.S., of Portsmouth, has invented this appliance (*Fig.* 124), for, as he says: "Sometimes during surgical operations it is very convenient to cut down upon the finger as a guide—when, for instance, in a septic peritonitis following perforated gastric ulcer it is desirable to drain the loin or pelvis, the most convenient way of making a counter-opening is to cut down from without upon the forefinger inserted in the original wound, because the finger can feel whether anything is in the way or not. If an instrument is inserted for this purpose, it may easily impinge a piece of intestine against the point of

puncture. But if the gloved finger be used unguarded this counter-puncture has to be made carefully and deliberately lest the gloves and, more serious still, the finger of the surgeon beneath it be cut. Again, a large abscess may be pointing, and be opened in front of the thigh. It is desired after opening it to make counter-punctures for better drainage at the sides. The finger is again the most convenient guide, because it can feel exactly the most dependent point of the abscess cavity. Examples could easily be multiplied, and will occur to every surgeon. To protect the finger when thus used as a

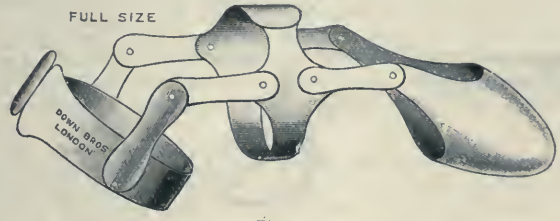

Fig. 124

director I have had the finger-guard, as depicted in the annexed drawing, made for me by Down Bros., and have found it very useful. It allows of as free flexion of the finger as if the latter were unguarded, and it can be cut down upon straight away. When used inside the abdomen, the forefinger, encased in the finger guard, and the middle finger are inserted together. The latter feels that nothing is in the way, and the guarded forefinger is then cut down upon at once with a single stroke of the knife. The instrument should be made to fit the finger of the surgeon using it."

Forceps.—We illustrate here the new form of forceps produced by Messrs. Reynolds & Branson, of Leeds. One (*Fig.* 125) is a light pattern of *gall-stone*

Fig. 125.

forceps, with curved, fenestrated blades (Blake's), length 7¼ inches, and the other (*Fig.* 126) is an excellent pair of *wound forceps* for approximating the edges of the wound while suturing. They are fitted with an easily releasing rack, and maintain their hold on the wound excellently. They are both exceedingly well made, and produced at a moderate price.

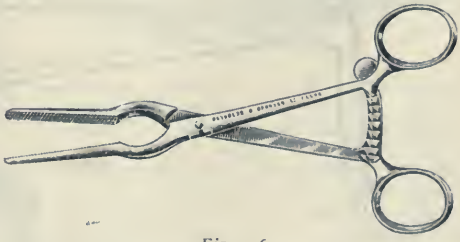

Fig. 126.

Messrs. Allen & Hanburys have produced for Mr. Lane some *intestinal clamp forceps* which are specially useful for clamping the intestine during the surgical treatment of constipation. They are also useful during the operations of pylorectomy and gastro-enterostomy. Their advantage is that

they permit the two portions of the intestine to be clamped and held firmly and steadily in apposition while being sutured. They are excellently made, and will much facilitate operation work.

The difficulty of tying beyond the points of the *artery forceps* in deep situations led Mr. A. Z. C. Cressy to try a globular end to the Spencer Wells', as illustrated in *Fig.* 127. He considers that they have these advantages: (1) They do not take up more tissue than other forceps; (2) The surgeon can tie off the artery by himself and take off the forceps afterwards; (3) Once the ligature is beyond the greatest circumference of the globular end it must tie off properly if it is tied tight enough, and the certainty of this saves much time in operating; (4) They will pick up the smallest and most fragile artery; (5) The circular grooves on the inner surface give a very firm hold. Messrs. Down Bros. are the manufacturers.

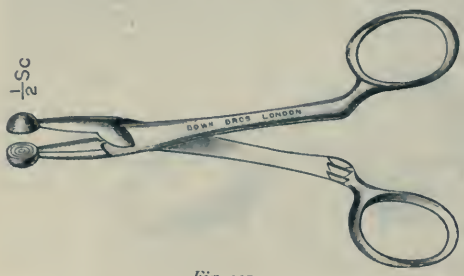

Fig. 127.

A New Suturing Forceps.—This is an excellent idea of Dr. P. J. Le Riche, of Worthing. From an examination of the blade of the forceps (*Fig.* 128), it will be seen that there is absolutely no strain upon either the skin or mucous

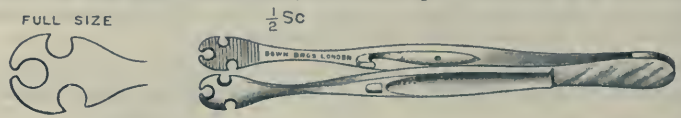

Fig. 128.

membrane while the needle is being passed through them, and the thread can be tied and cut with the forceps in position, thus avoiding the strain which is always present when a stitch is put in on the side of the forceps. We regard this as a very valuable invention, and we have no doubt it will appeal to many of our readers. Messrs. Down Bros. are the manufacturers.

The accompanying illustration (*Fig.* 129) depicts a modification of *Carwardine's suture forceps* which have been designed by Mr. W. E. Miles,

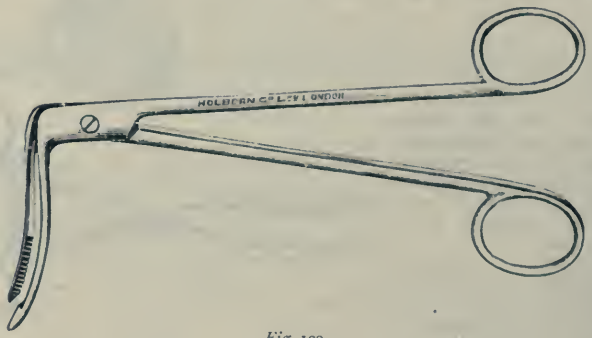

Fig. 129.

F.R.C.S., for use during the abdomino-perineal operation for removal of the rectum. The advantages are that the two blades of the forceps are in

close contact throughout their length when the forceps are closed, and the suture is not liable to slip from their grasp when working in the depth of a cavity. The blades, when closed, are slender enough also to render the forceps an efficient substitute for the ordinary aneurysm needle. In this way it is useful for ligaturing the internal iliac arteries during Wertheim's method of hysterectomy. They are excellently made by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Fractures (Treatment by Operation).—Messrs. Allen & Hanburys keep the plates and screws used by Mr. Lane in the operative treatment of fracture, and also the various instruments used in the process. They have published a catalogue containing full particulars of these appliances, together with some very interesting skiagrams showing actual cases under treatment. We are sure they would send a copy to any of our readers who are interested in the matter.

Fumigating Lamp.—This is practically another adaptation of Messrs. Ferris & Co.'s nursery lamp (which see). It is simply a means of using a night-light to set free vapour cresol or other antiseptic. It is quite a valuable adjunct to the sick-room.

Gastro-enterostomy and Cholecystostomy (Instruments for).—During the performance of gastro-enterostomy, or intestinal anastomosis, it frequently happens that the pouting mucous membrane of the already sutured half of the bowel is apt to be in the way of the needle while the anterior or return

Fig. 130

half of the mucous membrane is being sutured. To aid in the application of this suture Mr. Harold Upcott, of Hull, has had a protector made (*Fig.* 130) with ends of different sizes for gastric or intestinal work. It is applied after the posterior suture line is complete, and serves to depress the ridge of mucous membrane, at the same time affording a smooth surface over which the point of the needle readily glides. It is easily withdrawn before the suture is completed.

A three-bladed coaptation forceps (originally designed for the coaptation of skin edges) (*Fig.* 131) has also proved useful for lifting up in apposition the edges to be sewn.

Fig. 131.

The gall-stone bowl (*Fig.* 132) is of assistance in the cleanly performance of cholecystostomy. The apex of the gall bladder, after having been drawn through a hole in the centre of a sheet of thin rubber, is seized with two pairs of Porrier's forceps, which are allowed to hang over the projections on either side of the lip of the bowl; the gall-bladder is opened between them, and its contents readily scooped into the bowl, which rests upon the lower part of the abdominal incision. The above instruments have been excellently made by Messrs. Down Bros.

Fig, 132.

Gloves, Surgical.—We illustrate in *Fig.* 133 an improved wire frame for keeping gloves in shape during sterilization. They are supplied by the Medical Supply Association at 3/6 per pair.

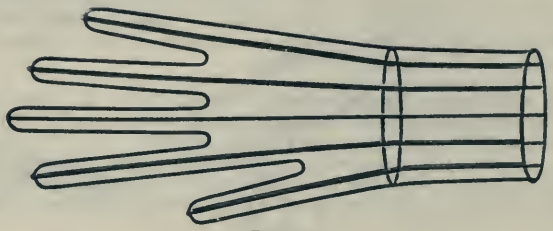

Fig. 133.

Knife-carriers.—A glass-stoppered tube, containing a Graefe's knife in an antiseptic solution, is shown in *Fig.* 134. This is a convenient method

Fig. 134.

of carrying a knife ready for use, and can be adapted for other knives which one may need on the visiting round. It is sold by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Messrs. Allen & Hanburys send us a metal sterilizer (*Fig.* 135) capable of containing two surgical scalpels with a suitable holder. The metal tube

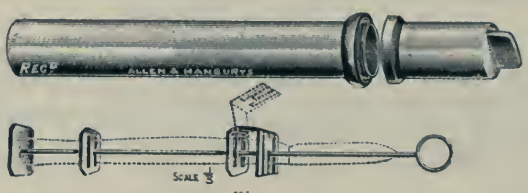

Fig. 135.

is filled with absolute alcohol, and the knives are placed in the case by means of the rack. This preserves the edges of the knives, which can be carried to the operation-table, and are ready for use at the moment required.

Fig. 136.

Ice Cap (Japanese).—This is made of a waterproof material which will not deteriorate like rubber, and is much cheaper than any other pattern. It is obtainable from Messrs. Reynolds & Branson, of Leeds, at 9d. each.

Inhalers.—*Hertz's Chloride of Ammonium Inhaler* (*Fig.* 136) is one of the most portable and practicable of these inhalers that have come under our notice. It is also one of the cheapest. Some suggestions are made for aiding the effect of the chloride of ammonium vapour. Thus in asthma it is suggested that a few drops of lignosulphite should be added to the solution; for nasal catarrh, a few drops of eucalyptus; and for headache, menthol may be added. It is supplied in box, with ammonia and acid at 2/9, by the Medical Supply Association.

Junker Inhaler (*Modified*).—The bottle illustrated in *Fig.* 137 is designed by Dr. Beresford Kingsford to give chloroform vapour of (fairly) uniform strength, sufficient for all ordinary nasal and oral operations, however long. Experiments show* that the vapour strength varies with the temperature of the chloroform from about 6 per cent at 40° F. to 12 per cent at 62° F., and so on up the scale. The bottle is made of metal, so that the temperature of the contained chloroform can be regulated between 40° F. and 75° F. by holding it in one hand as required. Glass windows allow the temperature to be read off the thermometer within. The air-current is driven by a foot bellows.

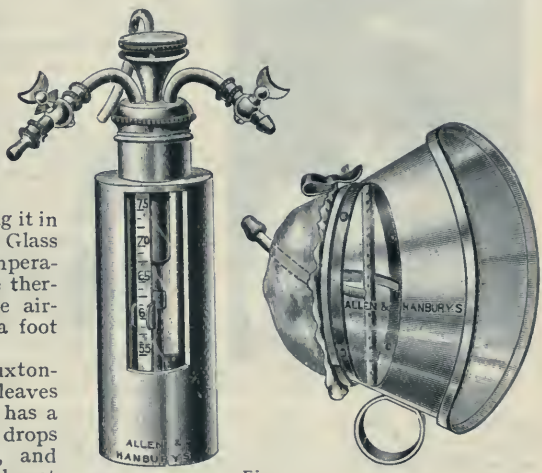

Fig. 137.

The combined Buxton-Schimmelbusch mask leaves all the face visible, it has a larger lint surface for drops than Buxton's mask, and presents that surface almost horizontally when the patient's face is turned to one side. Messrs. Allen & Hanburys, Ltd., are the manufacturers.

Ross's Aseptic Metal Oral Inhaler.—This instrument has been designed for the inhalation of medicated air in the treatment of diseases of the respiratory tract. It is made of a light white metal, which admits of its being boiled in soda solution, and thus easily rendered aseptic after use. It admits of no erosion in contact with the atmosphere, or absorption of septic matter, and can be used with both hands free and thus allow the user to follow his or her usual vocation. When required for use, a pellet of absorbent wool is dipped into any suitable medicament and then placed

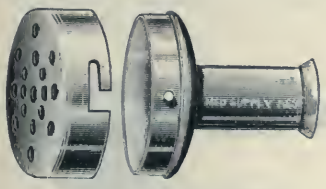
Fig. 138.

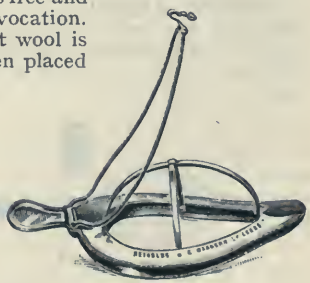
Fig. 139.

in the centre of a small round plate of the same material. The wool plate is then folded in over the pellet and placed in the mouth-piece. The end-piece is fixed on by means of a bayonet catch. This is a very practical appliance, and is supplied by the Medical Supply Association, W.C.

We illustrate (*Fig.* 139) *Schimmelbusch's Inverted Mask*, the advantage of which over the ordinary pattern is that, being cylindrical, it fits closer to the face, and can be held from the lower end instead of the top, as in regular pattern. It is supplied by Messrs. Reynolds & Branson, of Leeds.

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The *Shaw Inhaler* gives us a very simple but practical method of administering inhalations of vapour. It will be seen from our illustration (*Fig.* 140) that the appliance is a two-handled jug, so shaped as to fit the face when it is applied. There are a row of holes above the surface of the water to admit air. A welcome innovation is that clear directions are printed on the jug itself as to the

Fig. 140.

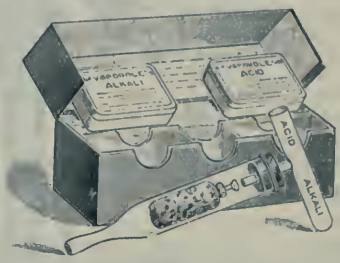


Fig. 141.

method of use and the exact height to add boiling and cold water to obtain definite temperature. We are sure that this appliance will give every satisfaction and save some trouble to the practitioner in giving instructions to the patient. It is produced by Messrs. Macphersons, 32, New Cavendish Street, W.

The *Chloride of Ammonium Inhaler*, introduced by Messrs. Burroughs, Wellcome & Co., is extremely compact and portable, and the acid and ammonia are contained in their well-known "Vaporoles." There are, therefore, no stock bottles of acid to carry, and no rubber tubes to spoil. We illustrate the apparatus (*Fig.* 141) which is a model of neatness, and which fulfils its purpose admirably.

Insufflator (Vaginal).—Under the name of the "Siccator" a very excellent insufflator has been introduced by Dr. Max Nassauer. It is practically useful for any purpose where powder has to be insufflated, but it is primarily intended for use for drying by means of powder the lining membrane of the vagina. Its shape (*Fig.* 142) renders it particularly suitable for this purpose.

Fig. 142.

We agree wholly with Dr. Max Nassauer that the treatment of leucorrhœa by dry powder is most efficient; and we have used this method for some years, but we have never had such a useful appliance for carrying out this treatment. We strongly recommend this instrument to our readers. It is quite practical, and very cheap. It can be obtained from the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Iodoform Worsted.—This is quite the best thing we have seen for keeping a wound or a sinus open. Worsted does not collapse like gauze, but retains its bulk, and the iodoform is conveniently introduced by means of it. It is put up in bottles by Messrs. Ferris & Co., Bristol.

Irrigators and Saline Infusion Apparatus.—The appliance we illustrate here (*Fig.* 143) was designed by Dr. H. Joseph Cates, for all purposes where we wish to give a continuous saline infusion, irrigation, or rectal feeding. It will be observed that the fluid used for this purpose can be maintained at a definite temperature owing to the water-jacket provided, which is made of metal. This supplies a well-known want in connection with the introduction of any kind of fluid into the body, and especially when this is done slowly, as in the case of saline infusion. We know that in many cases insufficient attention is given to the necessity of maintaining the solution as near the body temperature as possible, and even when it is recognized it is not always an easy matter. We therefore consider this appliance a very important addition to our resources. It is made by Messrs. Mayer & Meltzer, of 71, Great Portland Street, W., and costs 35/-.

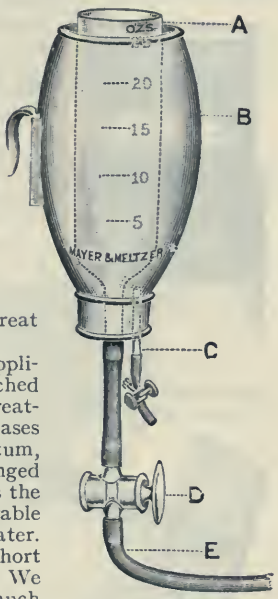
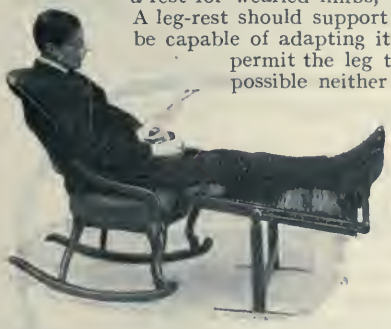


Fig. 143.

Rectal Irrigation Tube.—This is an excellent appliance for irrigating the rectum, and when attached to a suitable irrigator forms a very valuable treatment for many chronic rectal troubles. For cases of hæmorrhoids and chronic congestion of the rectum, there is nothing more soothing than the prolonged irrigation of water at about 90° F. This lowers the temperature of the rectum, and has more durable effects than either the use of very hot or cold water. In cases of atonic conditions of the rectum, short applications of cold water are very beneficial. We believe that irrigation of the rectum is a much neglected therapeutic resource, and this simple appliance will prove helpful in making it more practicable. It costs 5/6, and is supplied byMessrs. Ferris & Co., Bristol.

Ledger (Medical).—The Medical Supply Association, 228–230, Gray's Inn Road, W.C., have a new ledger designed to give a complete account for one year in respect to each patient upon a single page. The leaves are removable, so that the book can be built up as required. Sample leaves will be furnished on enquiry.

Leg-rests.—It is somewhat remarkable that while every one appreciates a rest for wearied limbs, there is no good leg-rest obtainable. A leg-rest should support the thighs as well as the legs, and be capable of adapting itself to any change of position and permit the leg to be flexed or extended. This is possible neither with the ordinary leg-rest nor the best lounge chairs. "*The Kumfee*" gets rid of these defects by the extremely simple method of using a cushioned frame swinging on pivots between two uprights. It is so arranged that the moment the user's limbs are removed, it assumes the vertical position, and appears as a handsome fire screen. It is not in the way when you want to sit down or rise from the chair. When in the vertical position the upper cushion folds back, and the


Fig; 144.

"Kumfee" then becomes an afternoon tea-table. Instead of being an encumberance when not wanted as aleg-rest, it is never in the way, and always useful. Having personally enjoyed a "Kumfee," we should be sorry to be without one. It is made in various woods, and is most elegantly upholstered, so that it is an ornament to any room. It costs only 25/-. The Purpose Manufacturing Co., Waldegrave Road, Teddington, are the manufacturers.

Fig. 145

Fig. 146.

Messrs. R. Sumner & Co., of Liverpool, have improved upon the T leg-rest by making the part against which the limb rests of canvas, and making this fold upon the upright part, so that it is more portable and convenient for travelling (*Fig.* 147). It is about 11 ins. wide and 26 ins. in length when folded up, so that it would pack into an ordinary trunk. It is a very distinct improvement upon the ordinary T leg-rest.

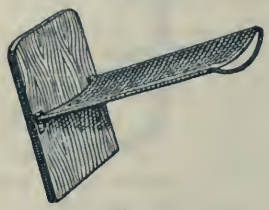


Fig. 147.

Mouth Gag (Gossett's).—This form of gag is of remarkable simplicity, and depends entirely upon one part sliding upon a metal bar, becoming fixed directly pressure is put upon its extremity. It is easily kept aseptic, and has nothing which is capable of getting out of order. We think that it will prove efficient under all conditions. Medical Supply Association, Gray's Inn Road, W.C.

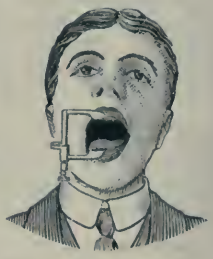


Fig. 148.

We have also received a modification of Gossett's mouth gag (*Fig.* 148) from Messrs. R. Sumner & Co., of Liverpool. The blades have solid extremities, and open up to 2½ inches. They are very easily sterilized, and have no parts to be injured in the process. These gags can also be used as self-retaining retractors. They cost 6/6 each.

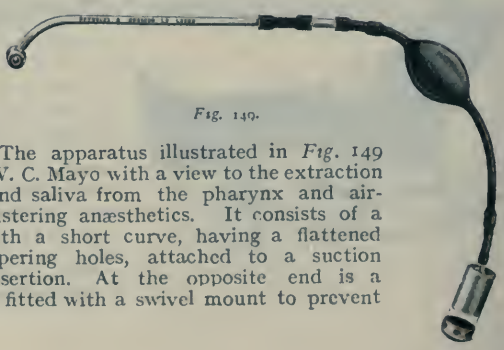


Fig. 149.

Mucus Evacuator.—The apparatus illustrated in *Fig.* 149 was suggested by Mr. W. C. Mayo with a view to the extraction by suction of mucus and saliva from the pharynx and air-passages, when administering anæsthetics. It consists of a plated metal tube with a short curve, having a flattened bulbous end with tapering holes, attached to a suction syringe with glass insertion. At the opposite end is a small metal receptacle fitted with a swivel mount to prevent

spilling, the bottom of which is detachable. This is a great improvement on the ordinary gag and sponge holder. It is easy to use and to sterilize. It is excellently made by Messrs. Reynolds & Branson, of Leeds, and costs 10/6.

Nasal Douche.—Messrs. Ferris & Co. send us a very neat little nasal douche. The glass vessel containing the fluid is held in the hand, and can be raised or lowered at will to check or accelerate the current. It is supplied with rubber tube complete for 1/6.

Nasal Mirror.—Dr. Glatzel has designed a " mirror " (*Fig.* 150), which is a piece of polished metal. The patient breathes through his nose upon the polished surface. By examining the impressions left on the mirror it is

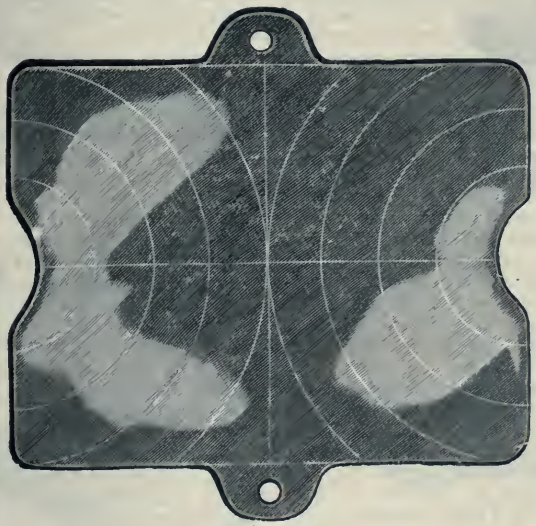


Fig. 150.

possible to form an idea of the patency of the nasal canal, and whether there is respiratory insufficiency. Holborn Surgical Instrument Co.

Nasal Snare.—We show here a snare designed by Dr. Wilfred Glegg, of the Birmingham Ear and Throat Hospital. The chief feature is the ease and rapidity with which the end can be threaded with wire. The point of the snare is small and rounded, so that the wire retains its loop and can be

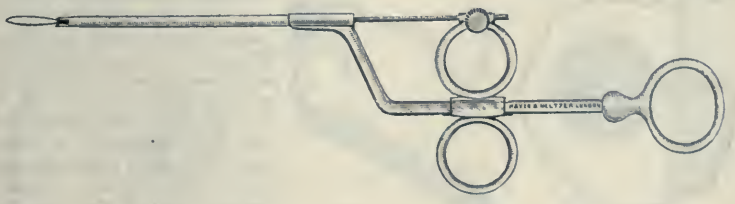


Fig. 151.

used for many polypi. The central rod is drawn straight back instead of over an angle as in some other forms. The snare is light and strong, and

has proved efficient by everyday use in hospital. It is made by Messrs. Mayer & Meltzer, of 71, Great Portland Street, W., which is a guarantee that it is thoroughly practical. It costs 21/–.

Nursery Lamp and Food-warmer.—This is an elegantly enamelled food-warmer to be used with a night-light, and is so arranged that the light can be directed to any portion of the room. It is a very practical appliance, and will find favour in every room where warm food is required in the night. It costs 2/6; and can be obtained from Messrs. Ferris & Co., of Bristol.

Fig. 152.

Ointment Applicator (Glass).—This is intended for the application of ointments to the skin. They are made (*Fig.* 152), with plain or ground-glass surfaces, and can be easily cleansed and sterilized. They will be found especially useful for mercurial inunction and all cases where ointments have to be rubbed into the skin. They are made by Messrs. Down Bros.

Oxygen Generator (Automatic).—This has been adopted by the French military and naval authorities. It entirely supersedes compressed oxygen cylinders, requires no supervision, and may safely be entrusted to the most inexperienced hands. The apparatus (*Fig.* 153) consists of the generator, wash- bottle, and indiarubber bag for storage of the gas. The generator comprises an exterior receptacle, covering a tubular cylinder (both made of enamelled iron); the bottom of the inner cylinder on which the cubes of sodox are placed is perforated; it is closed by a patent cover, fitted with a rubber washer, which forms a hermetic seal. The outer receptacle is to be filled with water. The oxygen is chemically produced by the action of water on cubes of sodox placed in the inner cylinder. "Sodox" is a peroxide of sodium, possessing the property of emitting absolutely pure oxygen immediately it comes in contact with water. It was first shown at the Academy of Science in April, 1902, by Professor Moissan, and at the College of Medicine in July, 1903, by Dr. Robin, of the Hospital Staff; it was invented by M. Georges P. Jaubert. The apparatus produces up to 100 litres of gas without recharging. The oxygen is 99·9 per cent pure, and may be easily warmed, medicated, or perfumed. A few drops of eau de Cologne or lavender water in the wash bottle impart a refreshing odour to the oxygen, or hot water may be substituted to warm the gas. The production of oxygen stops automatically when the apparatus is not in use. The cubes of "Sodox" keep indefinitely if dry, and are always ready for instant use. The apparatus possesses the following advantages: It is ready for use at all times. All danger of explosion is avoided, cumbersome and expensive materials, cylinders, manometers, etc., are done away with. Loss due to leakage, inevitable with the compressed gas, cannot occur, as the oxygen is only generated when the apparatus is being used. The cost of the apparatus is £3. Messrs. Oppenheimer, Son & Co. are the British Agents.

Fig. 153.

Fig. 154.

Fig. 155.

Radium Applicators.—Mr. W. Martindale, of 10, New Cavendish Street, W., has produced some very useful "applicators" for using radium (*Figs.* 154, 155).

They are made in various designs and of different metals, to suit the purpose for which they are required, those for use on the surface of the skin being of gold or aluminium. For burying in tissues or sinuses, a silver chain is attached to a suitably shaped "applicator," which is made in either gold, silver, or aluminium. For the rectum, a lead applicator is used. The price of these appliances, without radium, varies from 15/- to 42/-.

Safety Pin (The Lox).—These are an improvement on the ordinary safety pins, and they cannot come undone in use. They cost 5d. a dozen, and are supplied by the Medical Supply Association, Gray's Inn Road, W.C.

Shears for Bandages and Lint.—We have received from the Medical Supply Association, Gray's Inn Road, W.C., a curved bandage and lint shears (*Fig.* 156), one blade of which is serrated. This will be found most useful for cutting up

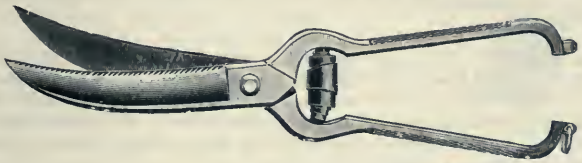


Fig. 156.

lint and dressings, and save much time, but it is hardly strong enough to cut through a roller bandage. It is none the less an appliance which should be in every surgery and hospital ward.

Specula (Bladder).—The illustration (*Fig.* 157) represents a dilating bladder speculum made for Mr. Thomas Carwardine, of Bristol. The

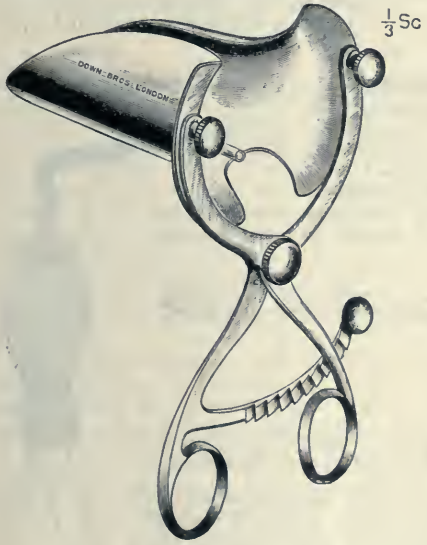


Fig. 157.

Fig. 158.

handles of the speculum are provided with a toothed rack, and may be used closed when examining the prostatic region, or the pouch left after prostatectomy; or expanded, as shown in the figure, e.g., when excising

villous growths. On the hinged side of the speculum an opening is left through which an electric light can be inserted (unless a head-lamp be preferred). The reverse side of the speculum gives sufficient dilatation to allow freedom for operative work, such as the excision of the base of a villous growth, the bevelling of the blades enabling the base of the growth to be brought near the surface, and the mucous membrane of the bladder sutured. The speculum was designed by Mr. Carwardine to meet a distinct want, and the various bevels and dimensions have been very carefully worked out; it has proved in practice to be a very useful instrument. It is made by Messrs. Down Bros.

Specula (Duck-bill and Fergusson's Combined).—This combination of Sims' speculum with Fergusson's (*Fig.* 158) is excellent, because it makes the use of either speculum more convenient: each forms such a good handle for the other. It is supplied in three sizes at 7/6 each, by Messrs. R. Sumner & Co., Liverpool.

Specula (Nasal).—The nasal speculum sent us by Messrs. Ferris & Co., of Bristol, has parallel blades which, when separated, give an excellent view of the back of the nostril, and are well adapted for the discovery and removal of polypi, or the performance of cautery operations. We have never seen a nasal speculum which better enables us to get a clearer view of the deeper recesses of the nose. It costs 5/6.

Hefferman's nasal speculum is an ingenious arrangement in wire, which gives an excellent view of the nares because there is nothing to obstruct vision. It is also self-retaining. By a little manipulation it is easy to make the spring of the speculum exercise more or less pressure. They are made right and left (*Fig.* 159), and only cost 2/- per pair. They are made by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

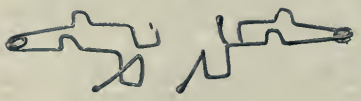


Fig. 159.

Spoon-Dropper for Aural Solution.—The advantage of the spoon for putting drops in the ear is admitted by Dr. Dan McKenzie, but he thinks it can be improved upon, as shown in our illustration, which explains itself. He is pleased with the spoon because it is so easily sterilized, and the act of doing so warms the spoon ready for the solution, which flows much more readily into the ear than

Fig. 160.

when a pipette is used. The spoon-dropper (*Fig.* 160) only costs 1/6, and is well made by Messrs. Mayer & Meltzer.

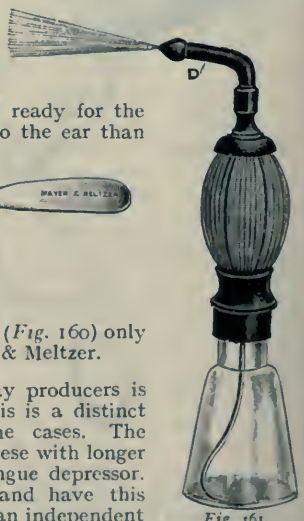


Fig 161.

Spray Producers.—The tendency in spray producers is to adapt them for use with one hand. This is a distinct convenience, and almost necessary in some cases. The Medical Supply Association have several of these with longer or shorter tubes and with and without a tongue depressor. They are thoroughly practical instruments, and have this advantage, that the bottle is furnished with an independent

stopper, so that it can be used for carrying fluid independently of the spray producer. We also notice that the tube going into the fluid is of fine flexible india-rubber, so that it cannot get broken, and if it becomes obstructed can be easily replaced. This is an important point, because it is just here that most sprays go wrong. (*Fig.* 161.)

The *Nebulique Spray* (*Fig.* 162), produced by Messrs. C. J. Hewlett & Son, has the advantage of using every drop placed in the receptacle, and will spray only a few drops of fluid when necessary,—an important point when fluids are costly. It is easily sterilized and cleaned, has no parts to get out of order, and is equally effective in all positions. It is also very compact. It costs 3/–.

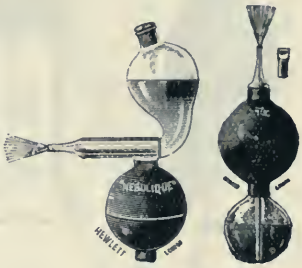


Fig. 162. *Fig.* 163.

The *Iris Spray* (*Fig.* 163), produced by the same firm, is on somewhat similar lines. It is all glass except the rubber ball, and there are no valves or movable parts to get out of order. It will, like the "Nebulique," spray all solutions, whether aqueous or spirituous. While an excellent spray when held horizontally, it can be used as a syringe for flushing wounds when held vertically. It only costs 2/-

Under the name of the *Pocket Aeriser*, Messrs. Oppenheimer, Son & Co. produce a small, convenient apparatus which will give a cloud of vapour

Fig. 164.

from any medicated solution of suitable specific gravity. The vapour produced is so fine that it will not condense on glass; in fact, it may aptly be described as rendering fluids "like smoke," and this vapour can be inhaled like ordinary air. Thus it will convey the medicament to the lungs if the inhalation be deep, without causing the slightest irritation. This instrument can be carried, charged ready for use, without danger of spilling the contents, and used in the street or public vehicle without attracting attention. (*Fig.* 164.)

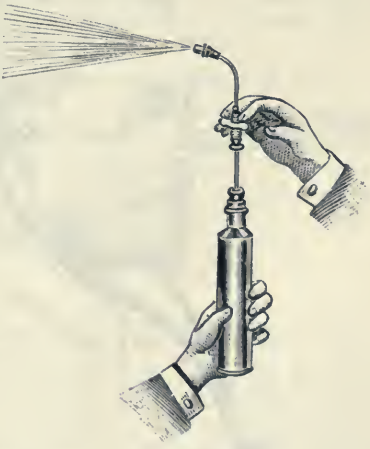
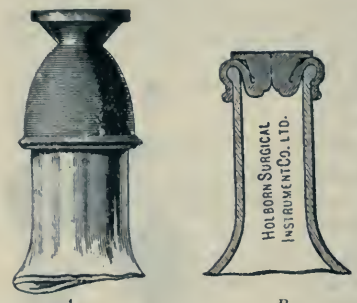


Fig. 165.

Metal Pump Spray.—This is an ingenious all-metal spray, in which the bottle holding the solution is used as a handle to pump the spray (*Fig.* 165). It has no indiarubber in its composition, and there is nothing that can possibly get out of order, which is more than can be said of most sprays. It gives a very wide spray, and is well adapted for disinfecting a sick-room. It is supplied by Messrs. R. Sumner & Co., of Liverpool.

Sterilizing Stopper.—A rubber sterilizing stopper has been made by the

Holborn Surgical Instrument Company, and used by Dr. Eyre at the bacteriological laboratories at Guy's Hospital with satisfactory results. The cap is shown sealing the mouth of a bottle containing fluid which has been sterilized by steam. The cap is made of soft rubber, the lower part, dome-shaped with thin walls, being slipped over the neck of the bottle (*Fig.* 166, *A*). The upper part is solid, but with a sharp clean cut running from the centre of the disc to the top of the dome. During sterilization the air in the neck of the bottle, expanded by the heat, is driven out through the valvular aperture in the solid portion of the stopper. On removing the bottle from the steam chamber, the liquid contracts as it cools, and the pressure of the external air forces together the lips of the slit, and drives the solid piece of rubber down into the neck of the bottle (*B*). Thus sealed, the bottle will preserve its contents sterile for an indefinite period.



A *B*

Fig. 166

Stethoscopes.—In a binaural stethoscope produced by Messrs. Reynolds & Branson, of Leeds, an entirely new method is adopted to secure it to the ears, which does away with the long curved tubes generally used, leaving the face quite free. The spring fits over the back of the head, is folding for portability, and can be adjusted by means of two small screws to any reasonable size. Ear-pieces are attached to the spring by means of short pieces of metal tubing, at the other end of which the rubber tubes with chest-piece are fixed. In the consulting-room or hospital ward, where a stethoscope is constantly in use, this pattern will be found a great improvement, as the tips can be withdrawn from the ears and the stethoscope then hangs from the back of the neck. We have found this instrument very comfortable in use and very superior to the ordinary variety.

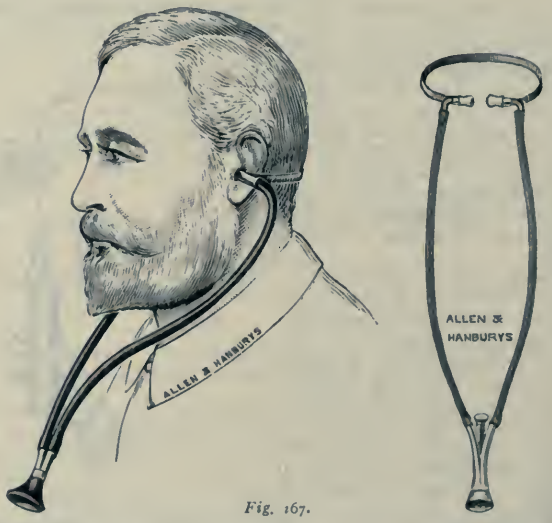


Fig. 167.

We have also received a binaural stethoscope (*Fig.* 167) on the same

principle from Messrs. Allen & Hanburys. It is exceedingly light and portable, and appears to have been received with great favour by those who use this form of stethoscope. It costs 7/6.

The Medical Supply Association, Gray's Inn Road, W.C., send us the "Grevillite Angular Chest Piece" and finger rest, which intensifies the sound owing to its mechanical construction. It is made entirely of metal. They have also a reversible chest-piece which enables a very small area or a larger one to be auscultated by simply removing and reversing the chest-piece. Both are excellent.

Messrs. R. Sumner & Co., of Liverpool, send us a binaural stethoscope (*Fig.* 168) with an arrangement for adjusting the pressure upon the ears, so that the particular degree preferred by the practitioner can be attained. To those practitioners who prefer a spring for retaining the ear-piece in the ear, the stethoscope will be very useful. They cost 7/6 each, and are excellently made and fitted.

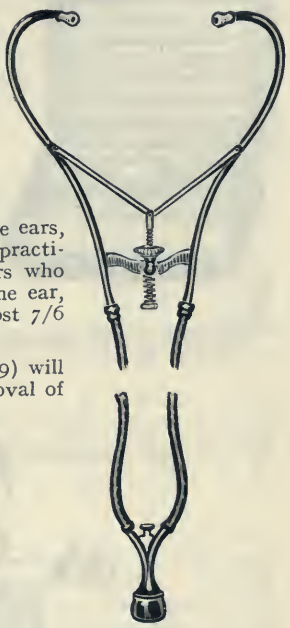


Fig. 168.

Stitch Scissors.—The shape of these (*Fig.* 169) will be seen to be particularly adapted for the removal of

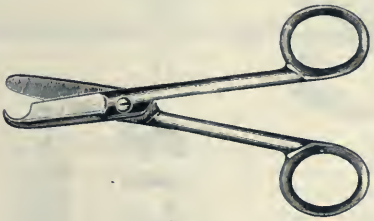


Fig. 169.

stitches. The hook on the end of one of the blades does not appear to interfere in any way with their use for other purposes. They should find a place in every surgical case. They can be obtained both from Messrs. Ferris & Co., of Bristol, and Messrs. R. Sumner & Co., of Liverpool.

Swabholder.—We illustrate in *Fig.* 170 a swab-holder designed by Mr. H.

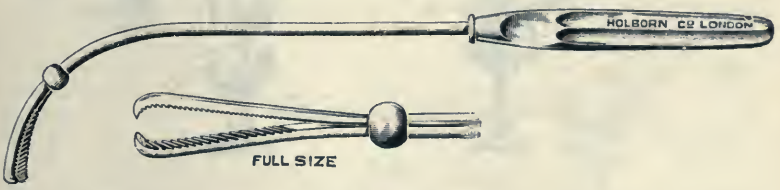


Fig. 170.

Kelson, F.R.C.S., and made by the Holborn Surgical Instrument Co. It is suitable both for post-nasal space and pharynx.

Syringe (Hypodermic).—It would be difficult to find anything more neat or efficient than this little case (*Fig.* 171), which, we find, measures 2 × 1½ in. × ¾ in. It is supplied by Messrs. R. Sumner & Co., and contains an all-glass syringe, with a solid glass piston. The nozzle to which the needle fits is of solid glass, and fits into the barrel like a glass stopper. This not only gives greater strength than the metal extremity, but also permits of absolute

antisepsis. All these parts are separate in the case. There are also provided five bottles for hypodermic pellets, and one containing alcohol. This is intended, after washing out the syringe to be drawn up into the barrel and then ejected back into the bottle. This removes all moisture from the needle, and makes the use of a wire unnecessary. It prevents rusting. We have used this method ourselves for a long while, and never insert a wire in the needle. This case complete costs 7/6, and we can strongly recommend it.

Fig 171.

In the "Wigmore Self-Repairing Syringe" (*Fig.* 172) Messrs. Allen & Hanbury have overcome the weakness of a glass barrel with metal fittings by enclosing the barrel in a strong metal mount, which practically ensures it against breakage, and should this occur, a new barrel can easily be fitted by the practitioner without sending the syringe back to the makers. It is fitted with a solid metal plunger, and we can see no part which is likely to either break or go out of order. The

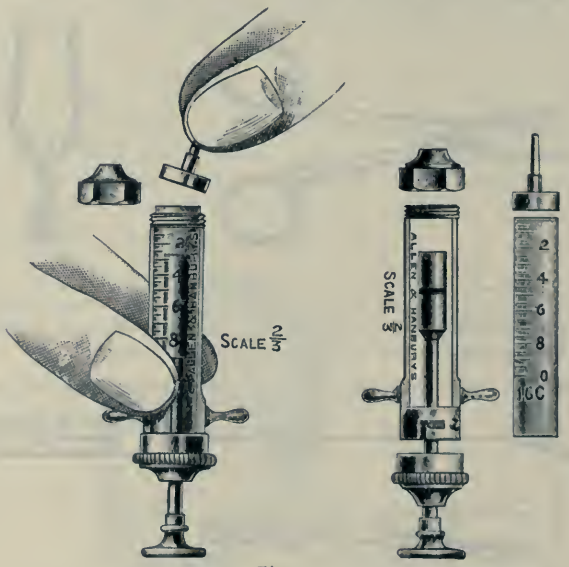


Fig. 172.

illustration will show the mechanism. It costs 10/-, or with spare barrel 14/-, for ordinary size, but can be had in all sizes up to 10 cc.

Messrs. R. Sumner & Co., of Liverpool, send us an all-glass *Serum syringe*. The piston is of solid glass without packing, and the case is so arranged that the piston is removed from the syringe when not in use. This is of advantage. It is absolutely easy to sterilize, and there appear to be no parts liable to break or get out of order. 10/6 complete.

Tongue Depressors.—Wooden tongue depressors are now made for use in infectious cases. They can be thrown away after use. They cost 2/6 per 100, and may be obtained of Messrs. R. Sumner & Co., of Liverpool.

Trocar for the Treatment of Liver Abscess.—This instrument (*Fig.* 173) is designed by Major L. Rogers, I.M.S., for the aseptic drainage and daily quinine irrigation of amœbic abscess of the liver. It consists of an aspiration trocar and cannula, the sheath of which is made of flexible silver-nickel tubing, so that it can be safely left in as a drainage tube, which will accommodate itself to the altered relationship of the traversed parts due to emptying the abscess cavity. The break in the cannula within the handle should be joined up by a piece of pressure rubber tubing, through which the trocar passes. This

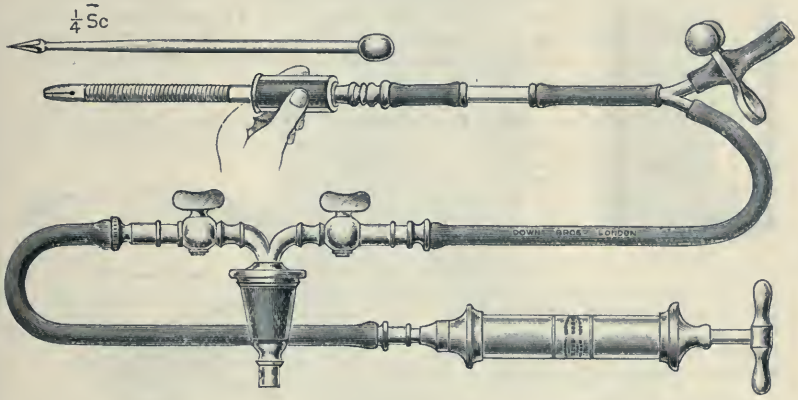


Fig. 173.

enables it to be clamped on withdrawing the trocar, so that no air is admitted in the process of connecting up the cannula with the aspirator or injection syringe. A plug is provided to fit the proximal end of the cannula for connection with the tubing leading to the aspiration bottle. A silver Y tube is also supplied to facilitate the daily aspiration and quinine injection. The single limb is connected by pressure tubing with the end of the cannula, and one of the branches by similar tubing with the aspirator. The other limb admits of solutions being injected by means of a glass syringe after aspiration without having to disconnect the tubes, this injection tube being clamped or closed with the fingers during aspiration. Messrs. Down Bros. are the makers.

Urethroscope.—This modification of Kelly's urethroscope (*Fig.* 174) will be appreciated by those who are compelled to study economy of space in packing the instrument bag or sterilizer, for one detachable handle serves for each of the three regular sizes, viz., 5, 7·5, and 10 mm. diameter. The 5 mm. bore urethroscope without the handle forms a convenient speculum for viewing the penile portion of the male urethra, and for securing material from the deeper portions of that canal for microscopical or bacteriological examination. The larger sizes, with handle in situ, can not only be used for the female urethra, but also for the vagina, and the 10 mm. instrument will even serve in emergency as a rectal speculum. This instrument was made for Dr. Eyre, of the Bacteriological Department, Guy's Hospital, by the Holborn Surgical Instrument Company.

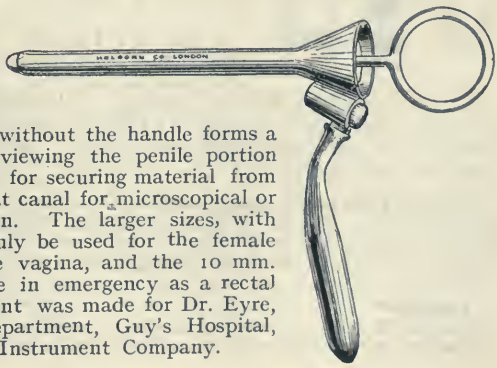


Fig. 174.

Urine Collecting-bottle.—Messrs. C. J. Hewlett & Son, of Charlotte Street, E.C., have designed a new bottle in which the neck is extended in the shape of a funnel, to facilitate the collection of samples of urine from the ordinary receptacles. Many medical men have experienced difficulty in utilizing ordinary bottles for this purpose, and will appreciate Hewlett's "Handy" collecting-bottle, as it is convenient in shape, secured by an india-rubber stopper, and enclosed in a neat japanned case. The bottle, which has a capacity of about 4½ oz., can easily be sterilized, and a roughened space is engraved on the front for writing the name of the patient (*Fig.* 175).

Fig. 175.

Urine Trial Glass.—The new form of urine glass here shown (*Fig.* 176) has many obvious advantages. Its mouth is wide enough for urination to be performed in it without splashing. Its calibre is wide enough to allow the specific gravity to be taken, and not so wide as to require too much urine, and the conical bottom facilitates the collection of the sediment. It is designed by Dr. R. M. Fraser, and made by Messrs. Mayer & Meltzer, 71, Great Portland Street, W. It costs 7/6.

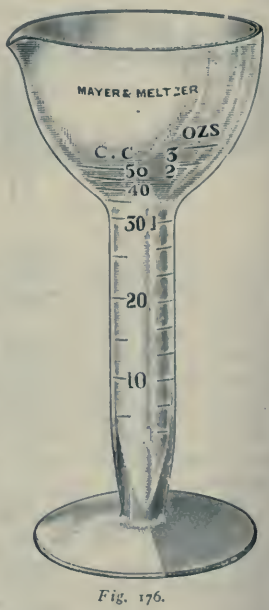


Fig. 176.

Urinometer.—The Medical Supply Association, Gray's Inn Road, W.C., send us a miniature pocket urinometer, with graduated trial jar and plain test-tube in a nickel-plated metal case. The mercury bulb of the urinometer is provided with an indiarubber protecting disc, so as to avoid breakage. This is a great improvement to this useful appliance. (*Fig.* 177.) Its cost complete is only 2/6.

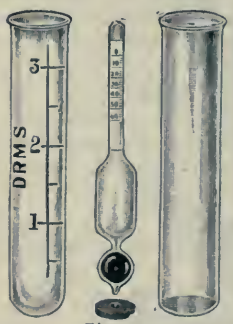


Fig. 177.

Uterine Sound (Bandl's).—Dr. Wilson, of Dublin, has modified this useful sound so that the difficulty of cleansing it from blood-clot and mucus is removed. It is, as made by Messrs. Fannin & Co., of Dublin, the best sound which the practitioner can possess; its advantages over the older forms are very great.

Vaginal Tube and Female Catheter.—These are made of glass for antiseptic purposes, but are covered with gum elastic, so that if from any cause they broke no harm would be done, as the pieces could not escape. They are supplied by Messrs. Reynolds & Branson, of Leeds.

Vaporizer.—We illustrate (*Fig.* 178) a simple form of vaporizer which is intended for "Pino-Cresol," but which could be used for eucalyptus or any antiseptic with which it is desirable to permeate the air of a room. We

have long advocated the use of such an appliance in all cases of influenza, not only for the patient's benefit, but to prevent infection being carried to others,

Fig. 178.

and we are glad that so cheap an article has been produced. They are sold retail with a bottle of Pino-Cresol for 1/6, by Messrs. R. Sumner & Co., Liverpool.

Wallet (Handy Pocket).—This is made of strong green canvas, waterproof lined, and fitted with 7 wide-mouth phials with metal caps for carrying pills, compressed tablets, etc. It has also a pocket for holding small dressings and sundries. It is quite the thing to take with one when travelling. It is not only neat and compact, but very cheap—it costs 2/-. It is made by Messrs. Ferris & Co., of Bristol.

PROGRESS OF PHARMACY, DIETETICS, &c.

Adrenalin.—Messrs. Parke, Davis & Co. have introduced some new tablets, each of which contains $\frac{1}{200}$ gr. of adrenalin, and is therefore of the same therapeutic value as 5 mins. of the 1–1000 solution. They are put up in tubes of 25 tablets, a form which is not only convenient for carrying, but also preserves the properties of the drug. For obtaining a prompt physiological effect, one or more of the tablets, as required, may be placed under the patient's tongue, whence the drug is rapidly absorbed, or may be dissolved in sterile water and administered hypodermically or intravenously. The tablets are also useful for adding to solutions of cocaine or other analgesic for topical or subcutaneous administration, to avoid pain and bleeding in minor surgical operations.

They have also a new adrenalin suppository. Each contains $\frac{3}{200}$ gr. of adrenalin (equivalent to 1–1000) and 3 gr. of chloretone, in a cacao-butter

base, and affords a reliable means of obtaining constringent, analgesic, and antiseptic effects in rectal disorders, such as hæmorrhoids, pruritus, ulceration, etc. We have found them exceedingly useful in practice. The same firm also put up a suppository containing $\frac{1}{100}$ gr. of adrenalin, 3 gr. of formidine (*vide* "Dressings, Surgical," *supra*), $\frac{3}{4}$ gr. of cocaine hydrochloride, and 3 gr. of extract of hamamelis. In analgesic power these suppositories are superior to the preceding, and they also include the valuable tonic astringent influence of hamamelis. They are employed in the same class of disorders as specified for the foregoing, and are supplied in boxes of one dozen.

Adrenin Snuff.—This is a combination of adrenin, menthol, cocaine, boric acid, and camphor, put up by Messrs. Ferris & Co., of Bristol. They issue it in bulk, or a bottle with perforated stopper for use of patient. These they supply at 9/- per dozen.

Agar-agar.—A new use has been found for this product. When specially purified it is recommended as a remedy for chronic constipation. Messrs. Ferris & Co., of Bristol, prepare it for this purpose.

Airol.—A compound of bismuth, iodine, and gallic acid containing 24·8 per cent of iodine. It is a fine greyish-green powder of low specific gravity, insoluble in water, odourless, tasteless, and not affected by light. On contact with moisture it liberates iodine, and can be used to replace iodoform, being cheaper and having no smell. It can be used as a dusting powder, and is also stocked as a gauze, glycerin 10 per cent, paste 20 per cent, or collodium 10 per cent. Airol is sold in powder at 2/- per ounce by The Hoffmann-La Roche Chemical Works, Ltd., 7 & 8, Idol Lane, E.C.

Albulactin.—This is a pure, sterile, soluble lactalbumin, which, when added to cow's milk diluted with a suitable quantity of water, provides the additional proteid required to make it identical in composition with human milk. It occurs as a greyish-white powder, with a slight taste which disappears when dissolved in milk. It has been used with excellent results, and is under trial at several London hospitals. Particulars and samples of this substance can be obtained of Messrs. A. Wulfing & Co., 12, Chenies Street, W.C.

Alpine Snow.—Under this name Messrs. Oppenheimer, Son & Co. produce a soothing toilet preparation containing wychodyne (distilled extract from fresh witch hazel), which is rapidly absorbed by the skin, and may be used on the most sensitive surface without producing irritation. It contains no grease. It may be used for removing the effects of exposure to the sun, wind, and weather generally, such as sunburn, chapping, redness, and irritation, also for skin massage in the nursery, or after shaving. It is issued in opal jars, price 2/6 each.

Antileprol.—This is the name given by The Bayer Co., Ltd., to a purified oil of chaulmoogra with a neutral reaction. The oil has been used since the earliest times as a remedy for leprosy, and Dr. A. Kupffer, of the Kuda Hospital for Leprosy, Estland, Russia, speaks highly of its value when sufficiently large doses can be borne, i.e., 15 to 300 drops a day. For this reason a purified preparation such as this is of great importance.

Anti-Asthmatic (Elixir).—This contains euphorbia, lobelia, nitroglycerin, and bromide and iodide of soda. It is the formula of Dr. Hare, and gives excellent results. It is prepared by Messrs. Ferris & Co., of Bristol.

Arsan.—This is an organic compound of arsenic with vegetable protein, i.e., glidine. It is supplied in tablets, each containing 0·002 gram of arsenic. It has the advantage that the arsenic is very slowly absorbed by the system, and is therefore much less toxic. It is indicated in all conditions where arsenic is required, and has been used in syphilis with excellent results. It is supplied by Messrs. Menley & James, Ltd., Farringdon Road, E.C.

Bismuth.—Bismutho cum Pepsina et Rhamno (*Liq.*) is an elegant, non-constipating preparation of bismuth, pepsine, and rhamnus frang. Each fluid drachm contains also: 5 min. tinct. nuc. vom. and 2 min. acid hydrocyan. dil. B.P. It is manufactured by Messrs. Reynolds & Branson, of Leeds, who also make Suppos. Bismuth. Subgallat. Co. Bismuth subgallate is non-irritant, antiseptic, and in suppository form in conjunction with resorcin and zinc oxide, is an excellent remedy for the relief of hæmorrhoids, etc. An ointment is also supplied in collapsible tubes.

Bismuth (Cream of).—This preparation of Messrs. Ferris & Co., of Bristol, contains 10 gr. of carbonate of bismuth to the drachm. It is a very elegant pharmaceutical product.

Bromoglidine.—A combination of bromine with glidine, a vegetable albumin. This causes the bromine to be more slowly absorbed by the system, and toxic effects are avoided. It is especially indicated in those cases where the bromides require to be used in rather full doses. It is put up in tablets each containing 0·05 gram of bromine by Messrs. Menley & James, Ltd., Farringdon Road, E.C.

Bromoline.—This preparation, like iodosan, is a combination of bromine with oil. This causes the bromine to be more slowly absorbed and eliminated. It has all the properties of the alkaline bromides, and is said to be equally effective when given by the rectum. It is prepared by Messrs. Oppenheimer, Son & Co., whose companion preparation, iodosan, is noticed *infra*.

Calcii Creosoti (Elixir).—This contains 5 per cent beechwood creosote in combination with lime. When creosote is treated by lime under certain conditions, a mixture of the calcium derivatives of the constituents of creosote is produced. This is chiefly composed of calcium guaiacolate and calcium creosote, and is chemically analogous to phenate of soda. It is less likely to upset the stomach than ordinary creosote preparations, but should be always administered freely diluted. Messrs. R. Sumner & Co.

Calcium Permanganate was found by Dr. J. Arbour Stephens to be superior to calcium lactate in the treatment of gastritis and rodent ulcer, administered by the mouth. Various cases have been reported which prove its efficacy in these complaints. As this salt is very deliquescent and has an extremely active nauseous taste, even when given in very dilute solution, Messrs. Oppenheimer, Son & Co. have put it in palatinoid form, which possesses special advantages, because the hermetically sealed jujube envelope prevents contact with the atmosphere, and permits the drug to be swallowed tastelessly; and being in a state of minute subdivision by admixture with an inert powder, irritation when swallowed is prevented. The drug keeps fresh and remains active, and is always ready for use. The treatment deserves a more extended trial, and the palatinoid appears a very efficient method of administration.

Messrs. R. Sumner & Co., of Liverpool, also put up this drug in capsule form at 1/6 per 100.

Cascara Purgans.—A concentrated, active, and agreeable preparation of cascara sagrada, in which the bitter principle is covered by aromatics, etc., so as to render the speciality perfectly pleasant to the palate. It permanently retains its activity and certainty in operation, and it can be taken for a long period without increasing the dose or changing to another laxative. Dose: As a laxative, 10 to 15 mins. morning and evening; as a purgative, 20 to 30 mins. morning and evening. Messrs. Woolley, Sons & Co., of Manchester, are the manufacturers.

Catheter Lubrication.—Messrs. Ferris & Co. have a special jelly for this purpose which is quite sterile and aseptic, and very emollient. They call it C. L. Jelly.

Chinosol.—Messrs. B. Kuhn & Co., 16, Rood Lane, E.C., have now put up tablets of chinosol each containing 1½ gr., so that quite small quantities of chinosol can be made up at a time when this valuable antiseptic is needed. This will be a great convenience.

Chocolate Tablets (Aperient).—These contain phenolphthalein, 1 or 2 gr. They are quite nice, and have an excellent aperient effect. Messrs. R. Sumner & Co., of Liverpool, make them.

Cholera Vaccines.—Messrs. Burroughs Wellcome & Co. are now supplying a cholera vaccine which, we trust, will have an extensive trial. To secure immunization two doses should be given hypodermically. The first dose consists of 1 cc. of vaccine, containing 1000 million bacteria. This dose should be repeated ten days later. It is issued in hermetically-sealed phials of 1 cc.

Chronic Bronchitis.—The value of balsam of peru is too often forgotten. Here is a good formula for the chronic bronchial catarrh of the aged: ℞ Balsam. Peru. ℥lxxx ; Pot. iod. gr. xvj ; Tinct. camph. co. ʒij ; Syrup and water to ʒviij. Messrs. R. Sumner & Co. prepare this in a concentrated form for dispensing purposes.

Cremor Antisepticus.—This is an elegant simple ointment containing oxide of zinc, boric acid, etc, nicely perfumed with rose. It is sold in bulk or in collapsible tubes at 7/- per dozen, by Messrs. Ferris & Co., of Bristol.

Cremor Saxol Co.—This contains saxol, sulphur, borax, etc. It has been found useful in seborrhœic eczema and acne, also in scabies. It is pleasant in use and free from odour. It is prepared by Messrs. Ferris & Co., Bristol.

Diabetic Dietary.—A decided change has come in reference to the proper diet of diabetic patients. The absolute exclusion of carbohydrates is seldom possible, and if insisted upon is a source of danger to the patient. The latest conclusion is that the proper diet for a diabetic patient should contain as much carbohydrate as can be assimilated—this can be ascertained by the sugar test ; and as much proteid as can be absorbed—this can be determined by the weight test. The Brusson Jeune establishment, who are probably the largest makers of gluten bread in the world, have given great attention to the fact, and as a result have produced a bread which is more palatable and more nutritious than ordinary gluten bread, and contains a smaller percentage of fat. It is produced in rolls, and has the crispness and silky texture of bread from which the bulk of the carbohydrates have been removed. It is much more palatable than gluten bread, and has yielded very satisfactory results in practice. But if we allow a certain proportion of carbohydrates in the bread of the diabetic, it seems possible that something more nearly approaching the softness of ordinary bread might be devised in addition to the crisp French roll type which the Brusson Jeune Co. supply. The London offices of the company are at Bedford Chambers, Covent Garden, W.C., and we would advise our readers to try these rolls for their diabetic patients.

Marmalade and Jam (*Sugarless*).—The patient who is told not to eat sweets, appears to think that an exception should be made in the case of marmalade. Why, we do not know. Messrs. Callard & Co., of 74, Regent Street, W., have now made it possible for even the diabetic patient to indulge in marmalade, because they have produced one which contains no sugar at all, and is yet very palatable. This will be good news to many of our patients. The same firm have also produced a jam, which if not quite sugarless is almost so. Both have been made more palatable since their first introduction.

One of the most important foods for diabetic patients is the *Tritumen bread* supplied by Messrs. R. Sumner & Co., of Liverpool. It is more palatable than gluten bread, and is starch-free. It is also rich in proteids,

being largely composed of pure wheat albumin. It is claimed that each loaf (roll, we should call it) contains as much assimilable albumin as three ounces of meat, or four eggs. Unquestionably patients thrive well on this bread, and it is growing in favour.

Diastase Co. (Tablets).—An excellent aid to digestion is a tablet put up by Messrs. Ferris & Co. It contains one gr. each of diastase, trypsin, and pepsin.

Digalen. — Digalen is a sterile standardized solution of amorphous digitoxin (Cloetta). The value of this comparatively recently discovered glucoside is its great solubility. It is easily absorbed and rapidly eliminated, thus giving a prompt digitalis effect without any cumulation. The solution can also be injected with perfect safety, and a powerful and prompt physiological response is obtained, when injected intravenously, in from two to five minutes. It will therefore be of great value before and after anæsthesia. The technique of intravenous injection is quite simple, the veins of the forearm usually being chosen. The dose is 8 to 15 min. thrice daily by the mouth ; or 15 min. intravenously injected will give a powerful result in a few minutes. It is sold in bottles of 15 cc. at 2/6 each, and also in ampoules, by The Hoffmann-La Roche Chemical Works, Ltd., 7 & 8, Idol Lane, E.C.

Ecsolent Compounds.—We have examined the "Compound," soap and powder made by the Ecsolent Company, Ltd., Saracen Buildings, Snow Hill, E.C. We believe they will form ideal preparations in the treatment of eczema and all irritable conditions of the skin. The following particulars of the nature of Ecsolent preparations have been furnished us by the makers :

Ecsolent Compound is manufactured by a special process which ensures the most perfect subdivision of every ingredient. In this compound are incorporated, in a petroleum base, a preparation derived from the destructive distillation of coal and wood, metadioxybenzol, and balsams, which with zinc oxide, boric acid, and wheaten starch, are so proportioned that while affording valuable germicidal and therapeutic properties, at the same time they produce a most soothing and grateful effect.

Ecsolent soap is manufactured on much the same lines as Ecsolent Compound. The odour of the medicament is efficiently and pleasantly covered by a coniferous extract, which in itself possesses therapeutic properties. The soap is free from all adulterants, free caustic alkali, resin, silicate of soda, irritating perfumes, colouring matter, and rancid fat, and it contains nothing of a nature deleterious to the most sensitive skin.

Ecsolent powder will be found a perfect antiseptic as a dusting powder for medical and toilet purposes. This powder can be specially recommended for use in surgical cases. There is no added perfume ; the delicate and fragrant odour is derived from antiseptic ingredients incorporated in the powder.

Elixirs.—Messrs. Reynolds & Branson send us samples of the following useful elixirs :—

Elixir Viburni et Hydrastis Co.—Prescribed in general practice as a sedative to inhibit the uterine movements in early pregnancy ; also in cases of dysmenorrhœa.

Elixir Thyroid, prepared from healthy glands obtained under stringent aseptic conditions, has great advantages over preparations of the dry gland, as we have repeatedly proved from clinical evidence. Each fluid ounce of elixir represents two glands.

Elixir Calcii Lactas.—Calcium lactate increases the coagulability of the blood and is less irritant than calcium chloride ; it is given before operations with this object, and in cases of chilblains, chronic ulcerations, rickets, and tuberculous disease.

Enzymogen.—Under this name Messrs. C. J. Hewlett & Son, of 35–42, Charlotte Street, E.C., produce an active elixir containing pepsin, pancreatin, and diastase. It is a powerful digestive agent, and can be recommended with advantage in cases of atonic dyspepsia.

Ergotoxine.—Ergotoxine, which is the hydrate of the crystalline ergotinine of Tanret, was first isolated in 1906 by G. Barger, M.A., D.Sc., of the Wellcome Physiological Research Laboratories, and F. H. Carr, F.I.C., of the Wellcome Chemical Works, who examined the physical and chemical properties of the alkaloid and several of its salts, which could be prepared in pure crystalline form (*Jour. Chem. Soc.*, 1906, 91, 337). Their formula has recently been confirmed by Kraft (*Archiv. Pharmacie*, 1908, 245, 644-5). The physiological action was investigated by H. H. Dale, M.A., B.C. (*Biochem. Jour.* 1907, ii. 240-299), and it was clearly shown that while ergotinine is practically inactive, the familiar effects of ergot on the blood-pressure and the uterus, and in the production of gangrene, are all produced by pure ergotoxine and its salts; in addition, they were found to produce the secondary paralytic effect on motor fibres of the sympathetic system which Dale had observed with many preparations, and which is characteristic of ergotoxine alone among pharmaceutical principles of which the action has yet been examined. This action has since been observed by various other physiologists with pure ergotoxine salts, and it is not regarded as being due to the presence of some impurity by anyone who has had any practical acquaintance with the subject or has familiarized himself with the literature. There is as little justification for the suggested identity with "cornutin," which is the name given by Kobert in 1884 to an impure alkaloidal resin which he obtained from ergot, and which had, as its distinctive physiological characteristic, the property of producing convulsions. Chemically pure ergotoxine, prepared from the pure phosphate, may be obtained in several B. W. & Co. preparations as "Tabloid" hypodermic products, each representing $\frac{1}{100}$ gr. of the pure alkaloid, alone or combined with morphine or strychnine sulphate. Ergotoxine is also presented in solution under the name "Ernutin," which is prepared for oral as well as hypodermic use.

Erythemol.—Messrs. R. Sumner & Co. now make up their excellent erythemol ointment in a form which will not stain linen. We have used their original ointment very extensively, and were not aware that it did stain anything. They have also made an excellent soap of the same ingredients, which has a remarkably demulcent effect upon the skin.

Ferro-Glidine.—This is a combination of iron with glidine, a vegetable albumin. It acts as a tonic food, and is very suitable for use in cases of anæmia, especially where the ordinary preparations of iron are not well borne; as it is free from the irritant effects of the simple inorganic preparations, and is absorbed more slowly. Messrs. Menley & James, Ltd., Farringdon Road, E.C.

Fructi Laxans (Syr.).—This is a laxative syrup prepared from figs, prunes, senna, etc. It is quite pleasant, and does not cause griping. It is made by Ferris & Co., Bristol.

Glycetracta. — Under this name Mr. W. Martindale, of 10, New Cavendish Street, W., supplies most of the well-known drugs prepared with glycerin instead of alcohol, with the result that they are cheaper to use, while the efficiency of the drug remains unimpaired. These preparations all represent 1=1 of drugs except those which are standardized to a definite alkaloidal content.

Glycerophos. Co. c. Format. (Syrup).—An excellent combination containing the sodium and potassium formates prepared by Messrs. C. J. Hewlett & Son, Charlotte Street, E.C.

Iodine Liniments.—Pigmentum Iodi 10 per cent, which contains 10 per cent of iodine with a hydrocarbon base, is largely used in place of liq. iodi fort.; it possesses the following advantages: it does not stain or crack the skin, is easily washed off with soap and water, and is less costly. It is prepared by Messrs. Reynolds & Branson, of Leeds. The same firm also prepare, under the name of Iodo-Krolein, a 5 per cent solution of iodine combined with wool fat (krolein), which is used when rapid absorption of iodine is indicated rather than for the purpose of counter-irritation.

Iodsam.—A chemical combination of iodine with oil, in two strengths, 10 per cent and 25 per cent. When taken internally, the slow liberation renders the iodine more completely diffused and assimilated than when the alkaline iodides are given. Iodsam passes through the stomach practically unchanged; hence it does not disturb the digestive functions, but is completely absorbed from the intestines without producing irritation. It is only slowly eliminated by the organism, hence it exerts a regular and continuous action, and its effects are more prolonged than when other iodides are administered, unpleasant symptoms (iodism, depression, etc.) are obviated, and an improvement in nutrition and general health is especially noticeable. It may be given by the mouth in the form of pulverettes, or by injection. It is prepared by Messrs. Oppenheimer, Son & Co.

Isham California Waters.—The natural mineral springs of Isham are in the south-west of California, and have an outflow of about 20,000 gallons a day. The water is tasteless and free from organic matter, but contains 49·75 grains of solids to the U.S. gallon. Carbonate of lime, sulphate and chloride of magnesium, and chloride of sodium are its chief constituents. but we observe that it has 3·09 grains of silica. It also contains carbonic acid gas in complete solution. It has been used for ailments of the uric acid type with marked success, and is a very popular drink in the United States. It is usual to take half a tumbler three times a day before meals. It is sold in this country in half-gallon flagons at £2 10s. per dozen, or 4/6 each, by the Isham Water Co., Albion House, New Oxford Street, W.C.

Jecovol.—Under this name Messrs. Jas. Woolley, Sons & Co., of Manchester, produce a cod-liver oil emulsion in which yolk of egg is used as the emulsifying agent. The product is a much more palatable and strengthening agent than emulsions made with "gum." In addition to 50 per cent of cod-liver oil, it contains the glycerophosphates. It is an excellent combination, which will meet the indications and be better borne than most others of its kind.

Lactigen.—Messrs. Oppenheimer, Son & Co. have here manufactured a a pure culture direct from the genuine Bulgarian lactic acid bacillus. They wish us particularly to note that "Lactigen" is *a pure culture* free from other micro-organisms—particularly spore-bearing bacilli—this constitutes a distinction from other milk-curdling preparations, which is of the highest importance and renders "Lactigen" much more effective when administered, and at the same time perfectly harmless even to infants. From half to one pint of curdled milk is the usual amount for a daily dose. The quantity is not of great importance, providing sufficient is given to inoculate the tract and so produce the desired result. In addition to the usual method of administration by the mouth, rectal and urethral injections have been employed with good results in cases in which the inciting cause is due to pathogenic micro-organisms. It has also been suggested for similar conditions in the nasal tract. In these cases, after the lactic acid bacilli have replaced the pathogenic bacilli, they can be easily removed by a weak solution of permanganate, leaving the membranes in a completely sterile condition. "Lactigen" is issued in tubes (each containing sufficient culture for one pint of milk) at 4/6 per dozen tubes.

Lactilloids and Lactules.—Under these names, Messrs. Ferris & Co., of Bristol, supply compressed tablets of lactic acid bacilli and also liquid cultures. The lactilloids or tablets can be taken three times a day in milk or sweetened water, or can be used to make curdled milk in the usual way. The Lactules are sealed glass vessels, each containing sufficient cultures for one pint of milk. Full directions are given with each box.

Lecithin (Elixir of).—Mr. W. Martindale, of 10, New Cavendish Street, W., has put up an elixir which contains 3 gr. of ovo-lecithin in 2 dr. This dose is given thrice daily after meals. The retail price of an eight-ounce bottle is 5/6. The value of lecithin as a brain and nerve stimulant that aids general nutrition is widely recognized, and its use is steadily increasing.

Luesan.—A new combination of mercury with the vegetable albumin, "glidine." The effect of the combination is that mercury is liberated more slowly, and the local irritant effects are avoided. It has been found that mercury administered in this form appears in the urine after twenty-four hours, and is still to be found in the urine up to the fifteenth day. This preparation is very valuable when it is necessary to give mercury in large doses or continue its use over long periods. It is put up in tablets each containing 0·01 gram of mercury. Messrs. Menley & James, Ltd., Farringdon Road, E.C.

Malta Fever Vaccine.—This is produced by Messrs. Burroughs Wellcome & Co., and may be used in cases of infection by the *Micrococcus melitensis*. In certain cases the vaccine produces a beneficial effect, the severity of the symptoms are diminished, the general conditions improved, and the duration of the disease curtailed. In the most acute cases, with high fever and symptoms of severe intoxication, it should not be used. The dose is 20 to 100 million organisms, repeated every ten days unless clinical symptoms contraindicate its use. It is issued in hermetically-sealed phials of 1 cc. containing 100 million organisms.

Malted Cocoa (Fry).—The value of the combination of cocoa with malt extract for invalids who have feeble digestive powers, and do not assimilate food well, is recognized by the profession. It is also an extremely useful preparation to give to patients on first waking at night, as it soothes the nerves and soon sends them to sleep again. Fry's malted cocoa is a combination of their pure cocoa extract with Messrs. Allen & Hanburys' extract of malt. It is important to mix it with water that is not boiling, so that the diastase of the malt remains unimpaired. We have found it very convenient to have some made and put into a Thermos flask, so that it can be taken warm when required, without waking an attendant or nurse. We often use a tablet of the milk chocolate prepared by the same firm, at night on first waking. Such measures render the use of the hypnotic unnecessary, and the patient is better instead of the worse for them. We use both these preparations in cases where milk diet is necessary. It makes an agreeable change from the ordinary routine.

Malto-Ferro.—This is an elegant combination of active malt extract with phosphate of iron, quinine, and strychnine; in this form the iron is readily tolerated by those whose digestion is deranged by the administration of iron; each fluid ounce is equivalent to 30 min. of Easton's Syrup. Dose: For adults, one to two tablespoonfuls; for children a dessertspoonful. It is prepared by Messrs. Reynolds & Branson, of Leeds.

Marienbad Pulverettes.—These consist of ext. casc. sagr. gr. $\frac{1}{2}$, ext. bellad. gr. $\frac{1}{10}$; ext. aloes aq. gr. $\frac{1}{3}$, pulv. rhei gr. $\frac{1}{4}$, podophylli gr. $\frac{1}{10}$. This is the official formula at Marienbad, and is that employed by Dr. Ott. The Marienbad pulverettes are used in connection with the waters in treatment of obesity, venous congestions, congestive headache, hæmorrhoids, catarrhal

dyspepsia, biliary calculus, intestinal obstruction, female diseases, etc. The following advantages are claimed for Marienbad pulverettes: (1) They excite secretion from the alimentary canal; (2) They stimulate peristalsis; (3) The action is distinctly cholagogue; (4) The aperient effect occurs without straining or griping, and the repetition of the dose produces a gentle, stimulant effect on the mucous membrane of the bowel, and ensures a regular healthy natural evacuation, which is so essential. The combination is much more effective than either of its constituents given alone, and its administration effects a complete clearance of the lower bowel, and in consequence prevents the formation of toxins and the auto-intoxication which follows their absorption, reinstating the normal functions of the hepatic and digestive systems in a surprisingly short time. Of course, a suitable diet is essential, and should be insisted upon.

Attention is directed to the advantages of the pulverette form of administering drugs. These powder pills have a thin chocolate and sugar shell, which, when pressed between finger and thumb, cracks like an egg-shell and releases the enclosed powdered medicament, at the same time enabling the drug to be taken without the taste being apparent. When swallowed, this coating dissolves almost immediately on reaching the stomach, and the drug is liberated in powder form ready for immediate absorption, thus offering obvious advantages over pills, compressed tablets, etc. Messrs. Oppenheimer, Son & Co. are the manufacturers, and put up a bottle of 100 pulverettes for 10d.

Mercurettes.—These are oblong blocks (cleanly and convenient), in which metallic mercury is most intimately incorporated with cacao-butter, and agreeably perfumed. Each block contains the amount of mercury present in 1 dr. of the pharmacopœial ointment, though in a somewhat greater dilution, which lessens danger of irritation to the cuticle. Any quantity that it may be required to use can easily be apportioned by cutting the block. They are primarily intended for the inunction treatment of syphilis, for which purpose cacao-butter provides an agreeable vehicle for the mercury in every way preferable to the lard and suet basis of the B.P. ointment. They may also be used for any condition in which the external application of mercury is indicated. Though of firm consistency, vigorous friction quickly causes the mercurette to penetrate the skin. Mercurettes are supplied in boxes of six. Messrs. Parke, Davis & Co.

Methymol Tooth Paste.—This is an excellent antiseptic tooth-paste put up by Messrs. Ferris & Co., of Bristol. It is quite nice to use.

Ophthalmic Ointments.—Messrs. C. J. Hewlett & Co. put up boxes containing a dozen collapsible tubes of ointments for ophthalmic practice. The following four varieties are stocked: ung. hyd. oxid. flav., atropine, cocaine, each 4 gr. to the ounce; and eserine 1 gr. to the ounce. They cost 6/- per dozen.

Opsapon.—A disinfectant, detergent, fluid, ether soap, containing cinnamic and carbolic acids with thymol; its bactericidal co-efficient is equal to 3 per cent carbolic acid. It forms a useful and effective disinfectant and detergent for use prior to operations. It will not dry or roughen the skin, hence is equally serviceable for disinfecting the surgeon's hands; and it possesses the further advantage over most disinfectants of not affecting surgical instruments. If a few drops be rubbed over the surface of a dental mirror, speculum, etc., clouding by moisture is prevented. It is supplied by Messrs. Oppenheimer, Son & Co.

"Optis" Dentifrice.—A name given by Messrs. Oppenheimer, Son & Co. to an antiseptic tooth-powder, pleasant in taste and efficient in action. Experience proves that friction with a powder is essential to properly cleanse

the teeth and keep them in good order. Liquids, though possessing antiseptic properties, are of little value in this direction. "Optis" supplies the necessary powder, and at the same time it is a powerful antiseptic uqual to the best liquid dentifrice. When used, it liberates H_2O_2, which is one of the most potent antiseptics and deodorants known, and at the same time it exerts a bleaching power which whitens the enamel of the teeth.

Phenolphthalein Tabellæ.—A safe and mild aperient, particularly useful in midwifery practice, as it does not affect the child. Its action is similar to that of the aperient sulphates, producing loose motions without griping or pain, in from four to six hours. It does not split up or become decomposed in the system, has no irritating action on the kidneys or intestines, and its depressant action is less than that of magnesium sulphate. It is put up in 1, 2, 3 & 5 gr. tablets, sweetened and flavoured; the 2 and 3 gr. tablets are also prepared with a chocolate base, and are exceedingly palatable. Messrs. Woolley, Sons & Co., of Manchester, are the manufacturers.

Physiological Standardized Drugs.—Prof. C. S. Sherrington, of the University of Liverpool, has adopted for the standard of such drugs as digitalis, strophanthin, etc., the isolated heart of a rabbit. This is a great improvement on the method by which the lethal dose on a frog was accepted as the standard. He also tests the action of ergot on the isolated uterus of the rabbit. The results have been very satisfactory, and Messrs. R. Sumner & Co. have adopted the standard in the preparation of these drugs.

Pituitary (Infundibular) Extract.—The researches of Schäfer, Oliver, and others, show that the extract of the pituitary body, when injected, produces a great rise of blood-pressure, the result of general vasoconstriction. It appears to act as a stimulant to muscle rather than through the nervous system; the arteries, the uterus, and the spleen being particularly sensitive to its action. It appears to have considerable diuretic effect. While resembling in its action the extract of the suprarenal gland, it is far less active in producing local anæmia. It is either absorbed very slowly or destroyed in the intestines, and is best given by hypodermic or intramuscular injection. Messrs. Burroughs Wellcome & Co. supply a vaporole containing the equivalent of 3 gr. of the fresh substance. This is preferably injected into the gluteal region.

Pituitrin.—Pituitrin is an extract of the infundibular portion of the pituitary gland. It exerts a vasomotor-constrictor action very similar to that of adrenalin, but somewhat more prolonged, and an influence on the circulatory system similar to that of digitalis and strophanthus. It increases the urinary flow very considerably. Pituitrin may be given either orally or hypodermically, in doses of from 10 to 30 min. four times daily. It is supplied in bottles of 1 oz. by Messrs. Parke, Davis & Co.

Pulticine.—An antiseptic, non-irritant poultice containing an organic iodine compound, boric and salicylic acids, pine oils, and natural methyl salicylate, with anhydrous glycerin and levigated calcined siliceous earth. It is an ideal method for the continuous application of moist heat in all forms of deep-seated or superficial inflammation and congestive conditions. It entirely supersedes poultices, mustard leaves, blisters, camphorated oils, etc. It is spread thickly over the affected part as hot as it can be borne, and covered with a pad of cotton-wool or gamgee. Thus used, it will maintain a uniform degree of heat for nearly twenty-four hours, and it has the advantage of being antiseptic, whereas linseed meal, bread poultices, etc., act as absolute culture media for many pathogenic organisms. Its hygroscopic nature causes absorption of exudates from abrased surfaces and facilitates free local circulation. It is prepared by Messrs. Oppenheimer, Son & Co.

Quinine Co. (Tablets).—In these tablets the combined alkaloids of cinchona bark are exhibited in conjunction with acetanilide, monobromised

camphor, ipecacuanha, and cascara sagrada. The combination is indicated in influenza, catarrh, and "colds in the head," in which maladies the tablets give marked relief. The cinchona alkaloids are of great value in the treatment of influenza, etc., and their effect is enhanced when administered together with stimulants, expectorants, and laxatives. They are made by Messrs. Ferris & Co., Bristol.

Quinine Sulphate.—Messrs. Ferris & Co. supply a sulphate of quinine which occupies about one-fourth the bulk of the ordinary sulphate. This "heavy" sulphate will have many practical uses, especially to travellers where bulk is a consideration. It is also more easily dispensed.

Rectones.—These suppositories, which are of an improved shape (containing aloin, belladonna, hyoscyamus, and nux vomica), are most effective in the treatment of chronic constipation in infants and children. It is generally recognized that the policy of giving aperients by the mouth as a routine practice is questionable, but these rectones act as a perfectly efficient laxative, without causing pain or griping, or disturbing the digestive functions. Rectal medication by means of suppositories is considered by Prof. Holt to be open to the fewest objections, and one of the most efficient measures of treating constipation in infants and young children. They are prepared by Messrs. Oppenheimer, Son & Co.

Sabromin.—This is a white powder, insoluble in water and alcohol, which is designed to take the place of potassium bromide. It contains 29·3 per cent of bromine and 3·8 per cent of calcium. It is claimed as less toxic than ordinary bromides on account of its slow absorption and excretion. The Bayer Co., Ltd., 19, St. Dunstan's Hill, E.C., are the manufacturers.

Sapogen Shampoo.—This is an adaptation of Sapogen for shampoo purposes, and is very antiseptic and cleansing to the scalp, and quite pleasant in use. It is prepared by Messrs. Ferris & Co., of Bristol.

Secacornin.—A sterile solution of those principles of ergot which are hæmostatic, and promote contraction of the uterus. It is standardized, and is four times the strength of extractum ergotæ liquidum B.P. The dose is 5 min. given by the mouth, or intramuscular injection may be employed. It is sold by The Hoffmann-La Roche Chemical Works, Ltd., 7 & 8, Idol Lane, E.C.

Fig. 179.

Sterisols.—Under this name Messrs. Ferris & Co., Bristol, issue glass capsules (*Fig.* 179) containing sterile solutions for hypodermic use. The large number of drugs which they keep ready prepared in this form, makes quite a formidable list. We think there is no drug in general use, or any form of tuberculin, which they could not supply at a moment's notice. They are quite up-to-date in this department, and can be relied upon.

Tablozenges is the name given to a series of small pastilles containing full doses of various volatile medicaments. When dissolved slowly in the mouth they give off the vapour of their constituents, and so the whole naso-pharyngeal tract becomes permeated by it. They are made with a fruit basis, and are extremely convenient owing to their small size. Mr. Frank A. Rogers, of 327, Oxford Street, W., keeps twelve formulæ in stock, giving various combinations of pine oil, menthol, eucalyptus, carbolic acid, terpene hydrate, and formalin. He has also one of heroin gr. $\frac{1}{60}$, and another of morphia and ipecacuanha in small doses. They will prove decidedly useful in practice.

Thigenol.—Thigenol "Roche" is the sodium salt of the sulphonic acid of a synthetically prepared sulpho-oil, which latter contains 10 per cent of firmly fixed sulphur. Thigenol in any proportion readily dissolves in

water and diluted alcohol, forming fluids with an extremely slight alkaline reaction. Thigenol is readily and uniformly miscible with fats, ointments, and glycerin. Stains due to thigenol can easily and completely be removed from linen and dressing material by soapy water. It has been used with success both in skin diseases and in diseases of women. It is prepared by The Hoffmann-La Roche Chemical Works, Ltd., 7 & 8, Idol Lane, E.C.

Thiocol.—This is a chemical substance containing 52 per cent guaiacol, yet it is perfectly soluble in water, odourless, and has not an unpleasant taste. By its means creosote medication can be carried to an extreme stage, without any of the nauseating or unpleasant symptoms associated with creosote being observable. "Thiocol" is bactericidal, and has been given with great success in tuberculosis and dysentery. The Hoffmann-La Roche Chemical Works, Ltd., 7 & 8, Idol Lane, E.C.

Thymi Extract (Saccharate).—This is prepared from a variety of *Thymus vulgaris*, and has been long used in Germany as a remedy for whooping-cough and laryngeal catarrh. Messrs. R. Sumner & Co. have imported a fluid extract, and members of the profession who have tried it give excellent reports. It is well that it should have a more extended trial in a troublesome form of complaint where new remedies are badly needed.

Thyresol.—This is a derivation of santalol, over which it has great advantages, not the least of them being that it does not repeat like oil of sandalwood. Thyresol contains no free hydroxyl groups, and is relatively non-toxic. It is almost insoluble in water, but readily so in alcohol. It is a valuable remedy in all inflammatory diseases of the urinary passages, such as gonorrhœa and cystitis. It is sold in tablets of 5 gr. each or in capsules, also in original bottles of ½ ounce by The Bayer Co., Ltd., 19, St. Dunstan's Hill, E.C.

Trifolii Co. (Syr).—Red clover has therapeutic effects in secondary and tertiary syphilis, and is also valuable in scrofula and chronic skin disease. It is put up with other alteratives in the form of a syrup by Messrs. Ferris & Co., of Bristol.

Tuberculosis-Immune Blood.—The treatment of tuberculosis by this serum, known as the "J. K." method, is rapidly gaining ground. Dr. Carl Spengler, of Davos, writes: "The tuberculosis-immune blood of artificially immunized healthy persons and animals has in the lytic state proved to be an important therapeutic agent for tuberculous man. It is necessary to break up the blood cells because the immune substances, enclosed and stored there in large quantities, have to be separated and extracted from their combination if they are to display their full action. It is best to prepare the immune substances chemically pure, free from albumin and hæmoglobin. It is in this form that animal immune substances also are free from disagreeable by-effects, which otherwise are caused by albumin derived from other species or the animal hæmoglobin respectively. The preparation, which is used for therapeutic purposes, and which contains the immune substances pure, has been called by me 'J.K.'" The author publishes a pamphlet in which a full description is given of the action of this substance, and directions for its use. This and the fluid can be obtained from Messrs. A. & M. Zimmermann, 3, Lloyds Avenue, E.C.

Tuberculins.—We have received from Messrs. Burroughs Wellcome & Co. some samples of their well-known brands of sera, vaccines, and tuberculins. The old tuberculin (Koch) is issued in two strains—human and bovine—for use according to the source of infection suspected. The injection of this tuberculin will cause a reaction in forty-eight hours if the patient is tuberculous, and in the case of negative results the injection may be repeated on the third day. Tubercle vaccine for treatment purposes is also issued by the same firm in emulsion in two strengths. They also issue tubercle bacilli killed

(human) for opsonic estimations, and tubercle bacilli killed and finely ground for agglutination tests. This is issued in fine powder, in tubes. The firm are in a position to afford ready assistance to the practitioner both in the treatment and diagnosis of tuberculous disease. They have also put up some minute pellets for placing in the eye for the ophthalmo-reaction, and also some similar pellets, without tubercle, to place in the opposite eye for control purposes, so that any reaction from mechanical causes which might occur cannot be mistaken for the specific reaction of tubercle. These are in a particularly neat little case which can be carried in the pocket-book.

Tuberculin Ointment (P., D. & Co.).—This ointment is composed of Koch's old tuberculin incorporated in wool fat in the proportions specified by Dr. Ernst Moro, who advocates its use for the cutaneous diagnosis of tuberculosis. He considers that the ointment reaction, which, of course, is very simple in application, is fully as reliable as the Von Pirquet method, whilst it avoids the scarification which the latter involves, and is much less risky than either subcutaneous injections or the conjunctival test according to Calmette. Tuberculin ointment (P., D. & Co.) offers a reliable means of applying the Moro test, and as it is packed in collapsible tubes it will prove a great convenience to the general practitioner. Messrs. Parke, Davis & Co. are the manufacturers.

"Tyramine."—"Tyramine" presents in a state of purity the organic base p-hydroxyphenylethylamine, which has recently been shown by re-researches at the Wellcome Physiological Research Laboratories to be the chief active principle of aqueous extracts of ergot. Given hypodermically or by the mouth, "tyramine" produces a marked rise of blood-pressure, with greatly improved vigour of the heart's action. "Tyramine" may be administered in shock or collapse, and for producing contraction of the uterus post partum. "Tabloid" hypodermic "tyramine" 0·005 gram is issued in tubes of twelve.

Ung. pro Tinea.—Under this name Messrs. C. J. Hewlett & Son, of Charlotte Street, E.C., put up a very powerful penetrating ointment for ringworm, containing β-naphthol, formaldehyde 1 per cent, with lanolin. It has given excellent results.

Vaporoles.—Under this name Messrs. Burroughs Wellcome & Co. put up a number of sterilized solutions ready for injection. The shape of the vaporole (*Fig.* 180), standing as it does on a firm base, is not only very elegant, but is very practical, as the syringe can be filled with no inconvenience. Among the various solutions contained in the "Vaporole," in addition to morphine, cocaine, eucaine, hyoscine, etc., is calomel gr. $\frac{3}{4}$, a sterile suspension in a neutral fatty base, with creosote and camphor, and also grey oil gr. $1\frac{1}{2}$. The cost averages 2/6 per box of 10.

Fig. 180.

BOOKS OF THE YEAR.

A List of the Principal Medical Works and New Editions Published during 1909.

*** *For the convenience of our readers any of the works in this list can be obtained from Messrs. John Wright & Sons Ltd., "Medical Annual" Offices, Bristol.*

AMBULANCE AND NURSING.

A B C of Nursing in Accidents and Illnesses. By E. M. Clarke. Revised and corrected by P. Barnet-Bentlif. 16mo. *Scientific Press. Limp, Net* 1*s.*

Boy Scout's First-aid Book. By "Scoutmaster." Cr. 8vo, pp. 112. *Simpkin - - - - - - - - - - Sewed, Net* 9*d.*

Construction, Equipment and Management of a General Hospital. By Donald J. Mackintosh. Roy. 8vo, pp. 166. *W. Hodge. Net* 10*s.* 6*d.*

Field Ambulance Guide. By G. H. Painton. 16mo. *W. Clowes Limp,* 2*s.* 6*d.*

Handbook for Nurses. By J. K. Watson, M.D. New and revised ed. *Scientific Press - - - - - - - - - - Net* 5*s.*

Home Nursing. With Notes on the Preservation of Health. By Isabel Macdonald. 12mo, pp. 342. *Macmillan - - - - Net* 2*s.* 6*d.*

How to Become a Nurse. The Nursing Profession, How and where to Train. Edit. by Sir Henry Burdett. New and revised edit. 12mo, pp. 463. *Scientific Press - - - - - - - - - Net* 2*s.*

Lectures on Surgical Nursing. By E. Stanmore Bishop. Illus. 12mo, pp. 150. *John Wright & Sons Ltd. Net* 2*s.* 6*d.*; *Leather, Net* 3*s.* 6*d.*

Manual of Nursing, Medical and Surgical. By L. Humphry, M.D. Illus., 32nd ed. *Griffin - - - - - - - - -* 3*s.* 6*d.*

Notes on Nursing. By Florence Nightingale. New ed. Cr. 8vo, pp. 112. *Harrison & Son - - - - - - - - - Net* 1*s.* 6*d.*

Nurses' Guide to Prescription Reading. 16mo. *Livingstone. Net* 1*s.* 6*d.*

Operative Nursing and Technique. A Book for Nurses, Dressers, House-Surgeons, Etc. By Charles P. Childe. Cr. 8vo, pp. 238. *Baillière Net,* 3*s.* 6*d.*

Practical Nursing. By Isla Stewart and Herbert E. Cuff. Revised 5th impression. Cr. 8vo, pp. 444. W. *Blackwood - - - Net* 5*s.*

Sick Nursing Examination Questions. A Catechism on Home Nursing and Hygiene. By D. M. Macdonald. 12mo, sd., pp. 34. *John Wright & Sons Ltd. - - - - - - - - - - Net* 6*d.*

Text Book of Nursing. By Margaret Donahoe, Philadelphia. *Appleton Net* 7*s.* 6*d.*

ANATOMY AND PHYSIOLOGY.

Anatomy of the Brain and Spinal Cord, with special reference to Mechanism and Function. For Students and Practitioners. By Harris E. Santee. 4th ed., revised. 8vo, pp. 490, 128 Illus. *H. Wilson Net* 16*s.*

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Castlebar (Co. Mayo).—*District Asylum.* Res. Med. Supt., F. C. Ellison, M.D. Access—Castlebar 1 mile.

Chartham (near Canterbury).—*Kent County Asylum.* Res. Med. Supt., G. C. Fitzgerald, M.D. Access—Chartham station, 1 mile.

Cheadle. — *Cheadle Royal Mental Hospital.* Res. Med. Supt., W. Scowcroft, L.R.C.P., M.R.C.S. Access—Cheadle, 2 miles.

Chester.—*Cheshire County Asylum.* Res. Med. Supt., A. Lawrence, M.D. Station, 1½ miles.

Chichester. — *West Sussex County Asylum (Graylingwell Hospital).* Res. Med. Supt., Dr. H. A. Kidd. Access—Chichester stat., 1½ miles.

Church Stretton.—*Stretton House,* Shropshire (for gentlemen). Res. Med. Prop., Horatio Barnett, M.B. Access—Church Stretton station, ½ mile. *See also p.* 936

The Grove House (for ladies). Res. Prop. and Med. Supt., Dr. McClintock. *See also p.* 941

Clonmel. — *District Asylum.* Res. Med. Supt., Dr. Bagenal C. Harvey. Access—Clonmel, 1 mile.

Colchester.—*Eastern Counties Imbecile Asylum.* Res. Supt. and Sec., John J. C. Turner. Access—Colchester.

Cork.—*District Asylum.* Res. Med. Supt., Dr. J. J. FitzGerald. Access—Cork, 2 miles.

Cupar (Fifeshire).—*Fife and Kinross District Asylum.* Res. Med. Supt., A. R. Turnbull, M.B. Access—Springfield station.

Darlington (Durham). — *Dinsdale Park.* Res. Med. Supt., H. W. Kershaw, M.R.C.S. Access—Darlington, 5 miles; Dinsdale, 1 mile. *See also p.* 939

Middleton Hall, Middleton St. George, Co. Durham. Res. Licen. and Med. Supt., L. Harris-Liston, M.D. Access — Dinsdale station, 1 mile.

Dartford.—*City of London Mental Hospital,* near Dartford. Res. Med. Supt., Dr. R. H. Steen. Access—S.E.R. Dartford, 1½ miles.

Denbigh (N. Wales).—*North Wales Counties Asylum.* Med. Supt., Dr. Llewelyn F. Cox. Access—Denbigh, 1 mile.

Derby.—*Borough Asylum, Rowditch.* Res. Med. Supt., Dr. Macphail. Access—G.N.R. station, 1 mile; M.R. 2 miles. *See also p.* 937

County Asylum, Mickleover, Res. Med. Supt., R. Legge, M.D. Access—Derby, M.R. 5 miles; Mickleover, G.N.R. 2 miles.

Devizes.—*Wilts County Asylum.* Res. Med. Supt., J. I. Bowes, M.R.C.S. Access—Devizes, 1 mile.

Dorchester.—*The County Asylum, "Herrison."* Med. Supt., P. W. Macdonald, M.D. Access—Dorchester, 3 miles.

Downpatrick.—*District Asylum.* Res. Med. Supt., M. J. Nolan, L.R.C.P.I. & L.M. Access—Downpatrick, 1 mile.

Drumcondra (Co. Dublin).—*Hartfield House.* Med. Prop., Dr. F. E. Lynch. Vis. Phys., Dr. Matthew Burke Savage. Access—Dublin, 2 miles.

Dublin.—*Bloomfield,* Morehampton Road. Med. Officer, H. T. Bewley, M.D. Access—Dublin, 1 mile.

Farnham House and Maryville, Finglas (for 56 patients, both sexes). Prop. and Res. Med. Supt., W. R. Dawson, M.D. Access—Cab from Dublin, 2 miles.

Telephone No. 1470. Consulting Rooms, 41, Upper Fitzwilliam Street, Dublin. Telephone No. 2867.

Highfield (for ladies), Drumcondra. *Hampstead* (for gentlemen). Glasnevin. Res. Med. Supts., Hy. M. Eustace, B.A., M.D., and Dr. Wm. N. Eustace. Access—By rail, Dublin. *See also p.* 940

House of St. John of God, Stillorgan. Res. Phys., Dr. P. O'Connell. Access—Stillorgan station, ½ mile; Dublin, 5 miles.

Richmond District Asylum. Res. Med. Supt., Dr. J. O'Conor Donelan.

St. Patrick's Hospital, James Street. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylum at Lucan. Asst. Med. Off., Dr. H. R. C. Rutherford. *See also p.* 942

St. Vincent's Asylum, Fairview. Vis. Med. Supts., Sir Francis R. Cruise, D.L., M.D., and John Murphy, F.R.C.P.I. Apply to the Superioress.

Stewart Institution, Palmerston, Chapelizod. Res. Med. Supt., F. E. Rainsford, M.D. Access—Kingsbridge station, 2½ miles.

Verville, Clontarf, near Dublin. Med. Prop., Dr. F. E. Lynch. Vis. Phys., Dr. M. B. Savage. Access—Dublin.

Woodbine Lodge, Rathfarnham, 6 miles (ladies). Prop., Mrs. Bishop. Med. Supt., Dr. A. Croly. Access—Rathfarnham tram, 2 miles.

Dudley (Stafford).—*Ashwood House,* Kingswinford. Props. Drs. Peacock and Pietersen. Res. Med. Supt., Dr. Pietersen. Access—Stourbridge Junc. 3½ miles, Dudley station, 4 miles; Wolverhampton, 7 miles. *See also p.* 944

Dumfries.—*Crichton Royal Institution.* Res. Med. Supt., Dr. C. C. Easterbrook. Access—Dumfries, 1 mile.

Dundee.—*Royal Asylum* and *District Asylum* Westgreen. Res. Med. Supt., W. Tuach-Mackenzie. M.D. Access—Dundee, 3 miles; Liff, 1½ miles.

Durham.—*County Asylum,* Winterton. Res. Med. Supt., Dr. W. St. J. Skeen, M.B. Access—Sedgefield station, 3 miles, by 'bus.

Earlswood.—*Training Home for the Feeble-minded and Imbecile.* Sec., H. Howard, 36 King William St., E.C. Res. Med. Supt., Dr. Charles Caldecott. Access—Earlswood station or Red Hill Junc., 1½ miles.

Edinburgh.—*Midlothian and Peebles District Asylum* (Patients, 350). Res. Med. Supt., R. B. Mitchell, M.D. Access—Rosslynlee station, 1 mile.

Royal Edinburgh Asylum. Morningside. Res. Phys. Supt., Dr. G. M. Robertson. Access—Edinburgh, 1½ miles.

New Saughton Hall, Polton. Med. Supt. J. B. Tuke, M.D. Access—Princes Street station, 20 minutes

Elgin.—*District Asylum.* Res. Supt., Alexander Hendry. Vis. Med. Off., Dr. D. G. Campbell. Access—Elgin, 1¼ mile.

Ennis.—*District Asylum.* Res. Med. Supt., Dr. F. O'Mara. Access—Ennis station, 2 miles.

Enniscorthy (Co. Wexford).—*District Lunatic Asylum.* Res. Med. Supt., Thos. Drapes, M.B. Access—Enniscorthy, 1 mile.

Epsom (Surrey).—*Abele Grove* (for ladies). Prop., Mrs. Atkins. Med. Supt., E. N. Reichardt, M.D.

The Silver Birches, Church Street (for ladies). Res. Licensee, Miss Daniel. Co-Licensee, Dr. E. C. Daniel. Access—L. & S.W.R. and L.B. & S.C.R., 5 minutes.

See also p. 938

Exeter.—*City Asylum*, Heavitree. Res. Med. Supt., R. L. Rutherford, M.D. Access—Exeter, 3 miles.

Court Hall, Kenton, near Exeter. Res. Licensees, Miss Mules, M.D., B.S., and Miss A. S. Mules. Access—Starcross, 1 mile.

Devon County Asylum, Exminster. Med. Supt., Dr. Arthur N. Davis. Access — Exminster, 1¼ miles; Exeter, 4 miles.

Wonford House (Hospital for the Insane). Res. Med. Supt., W. B. Morton, M.B., Lond. Access—Exeter station (Queen St.) 1½ miles; (St. David's) 2 miles. *See also p.* 945

Fairford (Gloucestershire).—*Fairford Retreat.* Res. Med. Prop., Dr. A. C. King-Turner. Access—Fairford.

See also p. 942

Glasgow.—*District Asylum*, Woodilee. Med. Supt., Hamilton C. Marr, M.D. Access—Lenzie station, 1 mile; Glasgow, 8 miles.

Glasgow District Hospital for Mental Diseases, Gartloch. Res. Med. Supt., W. A. Parker, M.B. Access—Garnkirk station, 1 mile.

Govan District Asylum, Hawkhead. Res. Med. Supt., Dr. W. R. Watson. Access—Crookston statn.

Kirklands Asylum, Bothwell. Res. Med. Supt., James H. Skeen, M.B. Access—Bothwell and Fallside stations, ½ mile; Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Shotts. Med. Supt., Dr. N. T. Kerr. Access — Hartwood, 5 minutes.

Royal Asylum, Gartnavel. Res. Phys. Supt., Landel R. Oswald, M.B.

Private Patients only; a special feature being the admission of recent acute cases at low rates of board.

Smithston Asylum, Greenock. Med. Off., Jas. Laurie, M.B. Access—Greenock West, 1½ miles.

Gloucester.—*Barnwood House.* Res. Med. Supt., J. G. Soutar, M.B., C.M. Access—Gloucester, 2 miles.

See also p. 946

Gloucester County Asylums, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. R. B. Smyth. Access—Gloucester station, 1 mile

Great Yarmouth.—*Royal Naval Hospital.* Fleet Surgeon in charge. Access—Great Yarmouth station, 1 mile. For Naval patients only, admitted by Admiralty order.

Guernsey.—*St. Peter Port Asylum.* Med. Off., E. K. Corbin, M.R.C.S.

Haddington, N.B.—*District Asylum*, 17 miles from Edinburgh. Med. Supt., J. Bruce-Ronaldson, M.D. Access — Haddington station, 10 minutes. *See also p.* 939

Hatton (near Warwick). — *County Asylum.* Res. Med. Supt., A. Miller, M.B. Access—Hatton station, 2 miles; Warwick, 3 miles.

Hayward's Heath.—*Brighton County Borough Asylum.* Res. Med. Supt., Edward B. C. Walker, M.D. Access—Hayward's Heath, 1½ miles.

Hellingly.—*East Sussex County Asylum.* Res. Med. Supt., F. R. P. Taylor, M.D *See also p.* 949

Henley-in-Arden (Warwickshire).—*Glendossil* (for both sexes). Res. Prop., Dr. S. H. Agar. Access—Henley-in-Arden, G.W.R., ¾ mile.

Hereford.—*County and City Asylum.* Res. Med. Supt., C. S. Morrison, L.R.C.P. Ed. Access—Barrs Court, Hereford, 3 miles.

Hitchin (Herts), near.—*Three Counties Asylum.* Res. Med. Supt., S. E. de Lisle, L.R.C.P.I. Access—Three Counties station, 1 mile.

Hull.—*City Asylum.* Res. Med. Supt., J. Merson, M.D. Access—Willerby station, 1 mile.

Inverness.—*District Asylum.* Med. Supt., T. C. Mackenzie, M.D. Access—Inverness, 2½ miles.

Ipswich.—*Borough Mental Hospital.* Med. Supt., Dr. E. L. Rowe. Access—Ipswich, 2 miles.

Isle of Man.—*Lunatic Asylum*, Union Mills. Med. Supt., W. Richardson, M.D. Access—Douglas, 3 miles.

Isle of Wight.—*The County Asylum*, Carisbrooke. Res. Med. Supt.-Harold Shaw, M.B. Access—Black, water, ¾ mile; Newport, 2½ miles.

Isleworth (Middlesex).—*Wyke House*. Res. Prop., Dr. F. Murchison. Access — Isleworth, Brentford, Osterley station, 1 mile.

Ivybridge.—*Plymouth Borough Asylum*. Res. Med. Supt., W. H. Bowes, M.D. Access—Bittaford, ¼ mile; Wrangaton G.W.R., 1½ miles; Ivybridge, 3 miles.

Jersey.—*Cranbourne Hall*, Grouville. Med. Supt., A. C. Stamberg, M.D. Access—Grouville, 2 mins. walk.
See also p. 942

The Grove. Res. Med. Prop., F. N. Gaudin, M.R.C.S. 2½ miles from St. Heliers, 2 from St. Aubin's.

Jersey Asylum, St. Heliers. Res. Med. Supt., Julius Labey, M.R.C.S. Access—Gorey Village, 1 mile.

Kilkenny.—*District Asylum*. Res. Med. Supt., G. F. West, L.R.C.P. Access—Kilkenny station, ¼ mile.

Killarney.—*District Asylum*. Res. Med. Supt., E. W. Griffin, M.D. Asst. Med. Off., G. W. Downing, L.R.C.P. & S. Access—Killarney, ½ mile.

Kirkby Lonsdale.—*Greta Bank*. Res. Licensee, Mrs. Taylor. Access—Bentham (M.R.) 2 miles.

Kirkintilloch (near Glasgow).—*Westermains Private Asylum*. For ladies; quiet cases only received. Apply to Mr. Jas. Lawrie, Res. Proprietor.
See also p. 945

Knowle (near Fareham).—*County Asylum*. Med. Supt., H. K. Abbott, M.D. Access—Knowle platform, ⅛ mile.

Lancaster.—*County Asylum*. Res. Med. Supt., D. M. Cassidy, M.D. Access—Lancaster, L. & N.W. and Midland stations, each 1¼ miles.
See also p. 939

Lancashire, nr. Newton-le-Willows.—*Haydock Lodge*, Private Mental Hospital. Res. Med. Prop., Dr. C. T. Street. Access—Newton-le-Willows, 2 miles.

Leeds (Menston, near).—*West Riding Asylum*. Res. Med. Supt., S. Edgerley, M.D. Access—Menston, 1 mile.

Leek (Stafford).—*County Asylum*, Cheddleton. Med. Supt., W. F. Menzies, M.D. Access — Wall Grange station, 1 mile.

Leicester.—*Borough Asylum*, Humberstone. Res. Med. Supt., J. E. M. Finch, M.D. Access—Leicester.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Access—Narborough ¾ mile; Leicester, 7 miles.

Letterkenny.—*Donegal District Asylum*. Res. Med. Supt., E. E. Moore, M.D. Asst. Med. Off., J. C. Martin, L.R.C.S.I. Access—Letterkenny and Lough Swilley Rly., 1 mile.

Lichfield.—*County Lunatic Asylum*, Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D. Access—Lichfield City, 3½ miles; Trent Valley, 4½ miles; Hammerwich, 1½ miles.

Limerick. — *District Asylum*. Res. Med. Supt., Dr. E. D. O'Neill. Access—Limerick station, ½ mile.

Lincoln.—*County Asylum*, Bracebridge. Res. Med. Supt., Dr. T. L. Johnston. Access—2½ miles from Lincoln G.N.R. station.

The Lawn. Res. Med. Supt., Arthur P. Russell, M.B. Access—Lincoln stat. 1 mile.
See also p. 938

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Med. Supt., Stanley A. Gill, B.A., M.D. Access—Formby station, ¼ mile distant.
See also p. 934

Tue Brook Villa, Liverpool, E. Res. Med. Supt., Dr. G. Duffus. Access — Tue Brook station or Green Lane car.

London.—*Bethlem Royal Hospital*. St. George's Road, London, S.E. Res. Med. Supt., Theo. B. Hyslop, M.D., M.R.C.P.E.
See also p. 947

Bethnall House, Cambridge Road, N.E. Res. Med. Supt., J. K. Will, M.D. Access—Cambridge Heath station.

Brooke House, Clapton, N.E. Props., Mr. H. T. Monro and Dr. J. O. Adams. Res. Med. Supt., Dr. Gerald Johnston. Access—Clapton, G.E.R.

Camberwell House, Peckham Road, S.E. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Offs., G. H. Keene, B.A., M.D., B.Ch., and H. J. Norman, M.B., B.Ch., D.P.H. Telegrams, "Psycholia, London." Telephone, Hop. 1037 *See also p.* 946

Chiswick House, Chiswick. Res. Lics., Dr. T. S. Tuke; Med. Supt., C. M. Tuke, M.R.C.S. Access—Chiswick station, ½ mile; Turnham Green station, 1 mile.

Clarence Lodge, Clapham Park, S.W. Prop., Mrs. F. Thwaites, B.A. Med. Off., Dr. Percy Smith. Access: Clapham Rd., and Clapham Common (Electric), 15 minutes. *See also p.* 938

Featherstone Hall, Southall. Res. Med. Lic., W. H. Bailey, M.D. Access—Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., T. Duncan Greenlees, M.D., F.R.S. Edin. Access—Tulse Hill, 5 minutes, and Herne Hill, 15 minutes. *See also p.* 948

Flower House, Catford, S.E. Res. Med. Supt., Dr. C. C. Bullmore, Access—C. & D. R. Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Access—Sunbury station, 1¼ mile.

Hayes Park, Hayes, Middlesex, near Uxbridge. Res. Med. Off., Dr. J. W. Higginson. Access—Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., F. W. Edridge-Green, M.D., F.R.C.S. Access—By M.R., Hendon station, ½ mile, or 'bus from Tube at Golder's Green.

London County Asylum, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., D. J. Jones, M.D. Access—Belmont station, ½ mile; Sutton station, 1½ miles.

London County Asylum, Bexley, Kent. Res. Med. Supt., T. E. K. Stansfield, M.B. Access—Bexley station, 1¼ miles.

London County Asylum, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Dr. J. M. Moody. Access—Coulsdon, S.E.R., or Stoat's Nest, L.B. & S.C.R., 10 minutes.

London County Asylum, Claybury, Woodford, Essex. Res. Med. Supt., Robert Jones, M.D. Access—Woodford station, G.E.R., 1½ miles.

London County Asylum, Colney Hatch, N. Res. Med. Supt., W. J. Seward, M.B. Access—New Southgate, G.N.R.

London County Asylum, The Manor, Epsom. Res. Med. Supt., W. Ireland Donaldson, M.D. Access—L. & S.W. and L.B. & S.C.R.

London County Asylum, Hanwell. Res. Med. Supt., Dr. P. J. Baily.

London County Asylum, Horton, Epsom. Res. Med. Supt., Dr. J. R. Lord. Access—L. & S.W. Rly., 1½ miles, L.B. & S.C.R., 1¾ miles.

London County Asylum, Long Grove, Epsom. Res. Med. Supt., C. H. Bond, M.D. Access—L. & S.W.R. and L.B. & S.C.R.

London County Colony, (Insane Epileptics), Ewell, Epsom. Res. Med. Supt., Dr. P. C. Spark. Access—L. & S.W. & L.B. & S.C.R. stations, 1½ miles.

Middlesex County Asylum, Tooting, S.W. Med. Supt., H. Gardiner Hill, M.R.C.S. Access—Wandsworth Common station, 1 mile.

Moorcroft House, Hillingdon. Uxbridge, 2 miles; London, 13 miles. Med. Licensees, Dr. R. J. Stilwell, and Dr. R. H. Cole. Access—West Drayton station, 2 miles.

Newlands House, Tooting Bec Road, S.W. (for gentlemen). Lic. Prop., A. H. Sutherland. Med. Supt., H. J. Hind, M.R.C.S. Access—Balham station, 1 mile, and tram. *See also p* 948

Northumberland House, Green Lanes, N. Prop., A. H. Stocker, M.D. Res. Med. Supt., Dr. Frank R. King. Access—Finsbury Park station, 1 mile. *See also p.* 944

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., A. H. Sutherland. Lady Supt., Mrs. Chapman. Access—West Kensington station, 1 mile. Barons Court station (Piccadilly Tube), 1 mile. *See also p.* 948

Peckham House, Peckham, S.E. Prop., Alonzo H. Stocker, M.D. Res. Med. Supt., Harold C. Halsted, M.D. Access—Peckham Rye sta., 10 minutes' walk. *See also p.* 947

St. Luke's Hospital, Old St., E.C. Res. Med. Supt., Wm. Rawes, M.D., F.R.C.S. Convenient to principal London stations. *See also p.* 947

The Grange, East Finchley, N. Res. Licensees, Dr. F. and Mrs. Watson.

The Priory, Roehampton, S.W., near Richmond. Res. Med. Supt., James Chambers, M.D. Access—Barnes station, 10 minutes.

Vine Cottage, Norwood Green, Middlesex. Res. Med. Prop., H. C. Titterton, M.R.C.S. Med. Supt., Dr. J. W. Higginson. Access—Southall, 1 mile.

West Ham Boro' Asylum, Goodmayes, Ilford. Res. Med. Supt., Dr. D. Hunter. Access—Goodmayes, ¾ mile.

Wood End House, Hayes (ladies). Uxbridge, 3 miles; London, 12 miles. Med. Lic., Dr. H. Stilwell. Access—Hayes station, 1 mile.

Londonderry.—*District Asylum.* Res. Med. Supt., Dr. Hetherington. Access—Londonderry, 1 mile.

Macclesfield.—*Parkside Asylum.* Res. Med. Supt., T. Steele Sheldon, M.B. Lond. Access—Macclesfield, 1 mile.

Maidstone.—*Kent County Asylum.* Res. Med. Supt., H. W. Lewis, M.D. Access—Maidstone, 1½ miles.

Malling Place and *Winthies Cottage* (for ladies), and *Castle House* (for gentlemen). Res. Med. Supt., Dr. Adam. Access—Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House.* Prop., Major Reilly. Res. Med. Supt., Dr. J. Selfe Lush. Access—Lavington, 1½; Devizes, 6 miles.

Maryborough (Queen's County).—*District Asylum.* Res. Med. Supt., Dr. P. Coffey. Access — Maryborough, ½ mile.

Melrose, N.B. — *Roxburgh District Asylum.* Res. Med. Supt., J. C. Johnstone, M.D. Access—Melrose, 1 mile.

Melton. — *Suffolk District Asylum*, near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Access—Melton station, 1½ miles; Woodbridge station, 2½ miles.

Middlesbro'.—*County Boro' Asylum.* Res. Med. Supt., Dr. J. W. Geddes. Access—Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., R. L. S. Donaldson, M.D. Access—Monaghan, ½ mile.

Montrose, N.B. — *Montrose Royal Lunatic Asylum.* Phys. Supt., John G. Havelock, M.D. Access—Hillside, ¼ mile; Dubton, 1 mile.

Morpeth. — *Northumberland County Asylum.* Res. Med. Supt., Thos. W. McDowell, M.D. Access—Morpeth station, 1 mile, by 'bus.

Mullingar. — *District Asylum.* Res. Med. Supt., Dr. A. Finegan. Access—Mullingar station, 1 mile.

Nelson (Lancs.). — *Marsden Hall.* Licensee and Med. Supt., P. G. Mould, M.R.C.S. Access—Nelson station, L. & Y. Rly.

Newcastle-on-Tyne.—*City Asylum*, Gosforth. Res. Med. Supt., James T. Callcott, M.D. Access—Newcastle, 4 miles.

Northampton.—*Berrywood Asylum.* Res. Med. Supt., W. Harding, M.D. Access—Castle station, 2½ miles Midland station, 3 miles.

St. Andrew's Hospital. Med. Supt., J. Bayley, M.R.C.S. Access—Northampton station, 1 mile.

Norwich.—*Heigham Hall.* Res. Phys. and Prop., J. G. Gordon-Munn, M.D; Access—Victoria station, 1 mile. Thorpe station, 1½ miles.

Norfolk County Asylum, Thorpe (1000 beds). Res. Med. Supt., D. G. Thomson, M.D. Access—Whitlingham, 1 mile; Norwich 2½ miles.

Norwich City Asylum, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Access—Hellesdon, 1 mile.

The Bethel Hospital for the Insane. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Access—Norwich (Thorpe) station, 1 mile. *See also p.* 941

The Grove, Old Catton, near Norwich.—(For ladies only.) Res. Med. Supt., C. A. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum*, Mapperley Hill. Med. Supt., E. Powell. M.R.C.S.

Notts County Asylum. Med. Supt., S. L. Jones, M.R.C.S. Access—Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., W. B. Tate, M.D. Access—Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles.

Omagh.—*District Asylum.* Res. Med. Supt., Geo. E. Carre, M.B. Access—Omagh station, 1½ miles.

Oxford.—*Oxford County Asylum.* Res. Med. Supt., T. S. Good, M.R.C.S. Access—Littlemore station.

The Warneford, Oxford, 1½ miles. Res. Med. Supt., James Neil, M.D. Access—Oxford station, 2½ miles. *See also p.* 949

Paisley.—*Lunatic Ward*, Poorhouse, Craw Road. Vis. Med. Off., T. Graham, M.D.; Res. Med. Off., Winifred M. Ross, M.B., Ch.B., Access—Paisley, 1 mile.

Paisley District Asylum, Riccartsbar. Med. Off., D. Fraser, M.D. Access—Paisley West, ¼ mile.

Perth.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.D. Access—Murthly.

James Murray's Royal Asylum, Perth (for private patients only). Phys. Supt., A. R. Urquhart, M.D., F.R.C.P. Ed. Access—Perth station, under 2 miles. *See also p.* 944

Plympton.—*Plympton House*, Plympton, South Devon. Res. Med. Supt., Dr. Alfred Turner. Access—Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also p.* 946

Portsmouth.—*Borough Asylum.* Res. Med. Supt., B. H. Mumby, M.D., D.P.H. Access—Fratton, 1½ miles.

Prestwich (nr. Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Acc.—Prestwich, 1 mile.

Rainhill (near Liverpool).—*County Asylum.* Res. Med. Supt., J. Wiglesworth, M.D. Access—St. Helens, 2½ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange*, 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Access—Grange Lane station, ¼ mile. *See also p.* 949

Salisbury.—*Fisherton House Asylum.* Med. Supt. and Res. Licensee, Dr. J. L. Baskin. Access—Salisbury station, 5 minutes. *See also p.* 938

Laverstock House. Med. Supt., Hy. J. Manning, M.R.C.S. Access—Salisbury, 1½ miles.

Sevenoaks (Kent).—*Riverhead House* (for ladies). Res. Med. Supt., Dr. Wm. H. Macartney. Access—Sevenoaks station, S.E.R., ¾ mile.

Shrewsbury.—*Salop & Montgomery Counties Asylum.* Res. Med. Supt., D. F. Rambaut, M.D. Access—Shrewsbury station, 2½ miles.

Sleaford.—*Kesteven County Asylum* Med. Supt., J. A. Ewan, M.D.

Sligo.—*District Asylum.*—Res. Med. Supt., Dr. Joseph Petit. Access—Sligo station, 1½ miles.

Stafford.—*County Asylum.* Res. Med. Supt., Dr. J. W. S. Christie. Access—Stafford, 1 mile.

Institution for the Insane, Coton Hill. Res. Med. Supt., Dr. R. W. Hewson. Access—Stafford, 1 mile. *See also p.* 937

Starcross (near Exeter).—*Western Counties Training Institution for the Feeble-minded.* Res. Supt., E. W. Locke. Access—Starcross station, G.W.R., 5 minutes.

Stirling.—*District Asylum*, Larbert. Med. Supt., Dr. R. B. Campbell. Access—Larbert, 1½ miles.

St. Albans (Hill End).—*Herts County Asylum.* Med. Supt., A. N. Boycott, M.D. Access—Hill End station, G.N.R., 2 minutes.

St. Leonards-on-Sea.—*Ashbrook Hall*, Hollington (for ladies). Res. Prop., Miss Adams. Med. Supt., Dr. J. Farrant Fey. Access—Warrior Square station, 2 miles.

Stone (near Aylesbury). — *Bucks County Asylum.* Res. Med. Supt., H. Kerr, M.D. Access—Aylesbury station, 3¼ miles.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Prop., E. Hollins, M.A. Access—Tamworth station, ¾ mile. *See also p.* 936

Taunton.—*Somerset & Bath Asylum,* Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Access—Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Asylum.* Props., Drs. H. & A. Newington. Access—Ticehurst Road 3 miles, Wadhurst S.E. & C.R., 4 miles.

Tonbridge. — *Redlands.* Res. Med. Supt., W. A. Harmer, L.S.A. Access—Tonbridge junc., S.E. & C.R., 2½ miles.

Virginia Water. — *Holloway Sanatorium,* Hospital for the Insane. St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., G. W. Smith, M.B., C. E. C. Williams, M.B., Sylvia R. M. Blackstone, M.B. Access—Virginia Water station, 5 mins. Seaside Branch, Hove Villa, Dyke Road, Brighton. Med. Off., E. Rivaz Hunt, M.D *See also p.* 945

Wadsley (near Sheffield). — *South Yorkshire Asylum.* Res. Med. Supt., W. S. Kay, M.D. Access—Wadsley Bridge, 1 mile.

Wakefield.—*West Riding Asylum.* Res. Med. Supt., W. Bevan-Lewis, M.Sc., L.R.C.P. Access—Kirkgate and Westgate station, 1 mile.

Wallingford (Berks).—*Berkshire Asylum.*—Res. Med. Supt., J. W. A. Murdoch, M.B. Access—Cholsey, 1 mile.

Warlingham (Surrey).— *Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Access—Croydon, 6 miles; Upper Warlingham, 3¼ miles. *See also p.* 949

Warwick.—*Midland Counties Asylum,* Knowle, near Birmingham (for feeble-minded children). Sec. and House Gov., A. H. Williams. Med. Off., J. O. Hollick, M.B., M.R.C.S. Access—Knowle, ½ mile.

Waterford.—*District Asylum.* Res. Med. Supt., J. A. Oakshott, M.D. Access—G. S. & W. R., North station, 2 miles.

St. Patrick's Institution, Belmont Park. Conducted by the Brothers of Charity. Med. Supt., W. R. Morris, M.B. *See also p.* 943

Wells.—*Somerset and Bath Asylum,* Wells, Som. Res. Med. Supt., Dr. G. Stevens Pope. Access—Wells station, 1½ miles; Masbury station, 2½ miles.

Whitchurch (Salop). — *St. Mary's House* (ladies only). Res. Med. Supt., C. H. Gwynn, M.D. Access—Whitchurch, 1 mile.

Whitefield (near Manchester).—*Overdale.* Res. Phys., P. G. Mould, M.R.C.S. Access—Prestwich and Whitefield station, 1½ miles; Molyneux Brow, ¼ mile.

Whittingham (nr. Preston).—*County Asylum.* Res. Med. Supt., Dr. J. F. Gemmel. Access—Grimsargh station, 1¾ miles; Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Periteau,* near Hastings (5 ladies). Prop., Mrs. R. V. Skinner. Med. Supt., E. W. Skinner, M.D. Access—Winchelsea station, 1 mile.

Witham (Essex).—*The Witham Asylum* (Licensed for both sexes). Res. Med. Licensee, Dr. H. E. Haynes. Access—Witham station, ¼ mile.

Woking. — *Surrey County Asylum,* Brookwood. Res. Med. Supt., Dr. J. E. Barton. Access—Brookwood station, 1¼ miles.

Worcester.—*County & City Lunatic Asylum,* Powick. Res. Med. Supt., Dr. G. M. P. Braine-Hartnell. Access—Worcester station, 4 miles.

York.—*The Pleasaunce* (ladies only). Prop. & Med. Supt., G. I. Swanson, M.D. Access—York, 1½ miles. *See also p.* 941

The Retreat. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). Access—York station, 1½ miles. Also Throxenby Hall, a branch house, near Scarborough. *See also p.* 936

Bootham Park Registered Hospital, York. Res. Med. Supt., C. K. Hitchcock, M.D., M.A. Cantab. Access—York station, 1 mile.

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., A. I. Eades. Access—York, 2 miles.

TRAINING INSTITUTIONS.

Alton (Hants).—*Chandos Lodge* (for backward and feeble-minded patients). Res. Med. Supt., Dr. Fletcher Beach. Access—Alton station, S.W.R., 15 minutes.

Bath.—*Magdalen Hospital School* (for backward and imbecile children). Med. Off., D. L. Beath, M.R.C.S. Clerk, E. N. Fuller, LL.B., 5, Old King St. Bath. Ac.—G.W.R. 1½ ml.

Bristol.—*Stoke Park Colony*, Stapleton (for mentally defective children). Apply to Secretary, National Institutions for Persons requiring Care and Control, 14, Howick Place, Westminster, S.W. *See also p.* 902

Dublin.—*Stewart Institution*, Palmerston, Chapelizod, Co. Dublin (for imbecile children). Med. Supt., Dr. F. E. Rainsford.

Dundee.—*Baldovan Institution* (for the training, treatment and education of imbecile children). Matron, Miss Henry, Med. Supt., D. M. Greig, F.R.C.S. Access—Baldovan, 1 ml.

Kingston-on-Thames (Surrey).—*Normansfield, Trematon & Conifers* (for backward and feeble-minded of either sex). Res. Med. Supt., Dr. Langdon Down. Access—Hampton Wick station, 8 minutes.

Lancaster.—*The Royal Albert Institution* (for the feeble-minded of the Northern Counties; 700 patients). Res. Med. Supt., Dr. A. R. Douglas. Secretary, Saml. Keir. Access—Lancaster station, 1 mile; and *Brunton House*, a Private Home in connection with the Royal Albert Institution.
See also p. 940

Larbert (Stirlingshire). — *Scottish National Institution* (for education of imbecile children). Res. Supt., A. A. Skene. Med. Officer, Dr. R. D. Clarkson. Sec. & Treas., A. J. Fitch, Virginia Buildings, Glasgow. Access—Larbert station, ¾ mile.

SANATORIA FOR CONSUMPTION, AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium*. Med. Supt., D. S. Johnston, M.D.

Aysgarth, S.O. (Yorks). — *Wensleydale Sanatorium*. Med. Supt., Edwd. M. Hime, M.B., Ch.B., Access—Aysgarth, ½ mile, via Northallerton, N.E.R., and Hawes Junction, M.R. *See also p.* 909

Banchory (Scotland).—*Nordrach-on-Dee*. Res. Phys., D. Lawson, M.A., M.D. Access—Banchory station, 1½ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne* and *Northumberland Sanatorium*. Med. Supt. Dr. W. C. Rivers.

Belbroughton (Worcs.). — *Bourne Castle Open-air Sanatorium*. Apply Res. Phys., W. Bernard Knobel, M.A., M.D. Cantab., M.R.C.S., L.R.C.P. Access—Hagley, G.W.R. Bromsgrove, M.R. *See also p.* 909

Benenden (Kent). — *Sanatorium* of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis." Res. Phys., Dr. W. Douglas Wilkins. Access—Biddenden station, 3 miles.

Bingley (Yorks.). — *Eldwick Sanatorium*, for females only. Vis. Phys., Dr. Margaret Sharp. Access—Bingley station, 2 miles.

Bournemouth. — *Alderney Manor*, Parkstone. Res. Phys., Dr. W. Denton Johns. Access—Parkstone station, 2 miles.

Royal National Sanatorium for Consumption and Diseases of Chest. Sec., A. G. A. Major. Res. Phys., Dr. E. C. Holtom. Access—Bournemouth station, 1 mile. Terms 7/6 per week and a Governor's nomination.

The Firs Home (for advanced cases). Hon. Sec., H. Gunton Turner, M.R.C.S., Bournemouth, Hon. Med. Offs., P. J. Duncan, M.D., and S. G. Champion, M.D. Lady Supt., Miss MaGuire. Access Bournemouth Central, ½ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Med. Supt, J. E. Esslemont, M.B., Ch.B. Access—Bournemouth Central, 2½ miles; Boscombe, 1½ miles; Christchurch, 2½ miles.

See also p. 908

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Sec., J. P. Maclay, Esq., 21, Bothwell Street, Glasgow. Med. Supt., John Guy, M.D. Access—Bridge of Weir, 2 miles.

Brighton. — *Municipal Sanatorium*, for Brighton townsfolk. Objects: educational, and for treatment of both early and advanced cases. Physician, Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Chagford (Devon).—*Dartmoor Sanatorium* (near Exeter, Newton Abbot, and Okehampton). Res. Med. Supt. and Prop., Dr. A Scott Smith. Access—Moretonhampstead, G.W.R., 6 miles; Okehampton station, L. & S.W.R., 11 miles.

See also p. 907

Cheddar (Somerset).—*Engel Home*, for gentlewomen and girls. Med. Supt., R. W. Statham, M.R.C.S. Apply to Lady Supt. Access—Cheddar station, 10 minutes.

Cheltenham.—*Cotswold Sanatorium*, Res. Phys., Dr. F. K. Etlinger. Address — Cotswold Sanatorium. near Stroud.

See also p. 906

Salterley Grange Sanatorium, near Cheltenham. Res. Phys., Paul Mathews, M.D. Access—Leckhampton, 2½ miles.

Chesterfield (Derbyshire).—*The Ashover Sanatorium.* Med. Supt., Dr. Ida E. Fox. Access—Stretton, M.R., 3½ miles.

Crieff (Perthshire).—*Ellerslie Sanatorium.* Res. Prop., Thompson Campbell, M.D. Access—Caledonian Railway, Crieff station, ½ mile.

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Med. Supt., C. S. Steavenson, M.B. Access—Dinsdale, 5 minutes.

See also p. 906

Devon and Cornwall *Sanatorium*, Didworthy, South Brent. For consumptive poor of the two counties. Hon. Sec., S. Carlile Davis, Esq., Princess Chambers, Princess Sq., Plymouth. Res. Med. Supt., J. E. Gordon, M.D. Access—Brent, G.W.R., 2 miles.

Doneraile (Co. Cork).—*Cork County Sanatorium*, Heatherside. Med. Supt., Dr. R. Ahern.

Dorking (Surrey). — *Woodhurst Sanatorium* (for Ladies and Girls only), Tower Hill. Sec., Geo. Wright. Visiting Phys., Miss Mary R. McDougall, M.B., C.M. Ed. Access—L.B. & S.C.R. and the S.E. stations, both about 1 mile.

Terms: from 30/- weekly according to bedroom accommodation.

Dundee (nr.), *Sidlaw Sanatorium*, Res. Phys.. Dr. A. K. Traill. Access—Auchterhouse stat. 1½ mls.

Durham.—*Durham County Consumption Sanatoria.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. Terms free and by payment. For males: Stanhope, Med. Supt., Dr. John Gray. Access—Stanhope station, 1 mile. For females: Wolsingham, Med. Supt., Dr. Menzies. Access — Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption.* For the treatment of poor patients. Visiting Physicians, Dr. R. W. Philip and Dr. G. L. Gulland. Clerk and Treasurer, 4a, St. Andrew Square, Edinburgh.

Woodburn Sanatorium, Morningside. Res. Med. Prop., Mrs. I. Mears, L.R.C.P.I.

Eversley (Hants).—*Moorcote Sanatorium.* Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Wokingham sta., 6 miles; Fleet, 6 miles.

See also p. 909

Farnham (Surrey). — *Crooksbury Sanatorium.* Res. Phys., Dr. F. Rufenacht Walters. Access—Farnham station, 3½ miles; Tongham, 2½ miles; Ash, 4 miles.

See also p. 905

Whitmead Sanatorium. Res. Phys., J. Hurd-Wood, M.D. Access—Farnham station, 3½ miles.

Fortbreda, Belfast.—*Forster Green Consumption and Chest Hospital.* Res. Phys., Dr. Robert May. Sec., A. Shaw, 2, May Street, Belfast, Access—Belfast, 2 miles. Mainly for the poor; 6 beds free; others by small payment.

Frimley (Surrey).—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. Marcus Paterson. Access—Frimley station, 2 miles.

Grange-over-Sands.—*Westmorland Sanatorium.* Res. Med. Supt., H. G. Sutherland, M.D. Access—Grange-over-Sands station, 2¾ miles.

Hastings.—*Fairlight Sanatorium.* in connection with Margaret Street Hospital for Consumption and Diseases of the Chest (for Out-Patients), 26, Margaret Street, London, W. Sec., Alice M. Greg. Med. Off., Dr. N. F. Stallard. Access—Hastings, Tram, about 15 minutes. Payments: by subscriber's letter, 11/6, without, 17/6

Hull.—*Hull and East Riding Convalescent Home,* Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproulle, L.R.C.P. Access—Withernsea stat.

Isle of Wight. — *Royal National Hospital for Consumption,* Ventnor. Res. Phys., Dr. James Gilchrist. Sec., Ernest Morgan, 18, Buckingham Street, Strand, W.C. Terms 10/- per week and a recommendation from a Governor. Access—Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for advanced cases). Apply to Sister Bernardine, S.S.M. Med. Off., H. F. Bassano, M.A., M.B., Access—Ventnor, 5 mins. drive. Terms, by selection, 10/6 per week.

Kinross-shire (Scotland).—*Coppin's Green Sanatorium* and *Ochil Hills Sanatorium.* Med. Supt., J. E. Chapman, M.R.C.S. Access—Kinross junction, 4 miles.

Lanark.—*Bellefield Sanatorium.* Res. Med. Supt., Dr. J. W. Allan.

Leeds.—*Leeds Sanatorium for Consumptives,* Gateforth, near Selby, and *Leeds Hospital for Consumptives,* Armley. Sec., C. H. Sedgwick, 37, Great George St., Leeds. Terms free, for poor of Leeds.

Liverpool.—*Liverpool Sanatorium for Consumptives,* Kingswood, Frodsham. Sec., Alfred Shawfield, 77*a*, Lord St., Liverpool. Res. Phys., Dr. H. H. Thomson. Access—Frodsham station, L. & N.W.R., 3½ miles.

Llanybyther (Carmarthenshire). — *West Wales Sanatorium.* Med. Supt., Dr. G. B. D. Adams.

London.—*City of London Hospital for Diseases of Chest,* Victoria Park, E. Open-air treatment provided. Sec., H. Dudley Ryder.

Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead. Access—Finchley Road (Met.) station, 1 mile. *Country Branch Hospital at Northwood.* Access—Northwood (Met. & G.C. Rly.) Hon. Vis. and Res. Staff. Free on recommendation of governors. Secretary, W. J. Morton.

Royal Hospital for Diseases of the Chest, 231, City Road, E.C. Med. Off., W. N. A. Paley, M.R.C.S. Apply to the Secretary.

Long Stratton (Norfolk).—*Fritton Open-Air Colony,* The Beeches. Med. Director, Dr. Annie McCall, 165, Clapham Road, S.W. Access — Forncett station, G.E.R., 4 miles.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest.* Hospital at Bowdon; Crossley Sanatorium, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester. Res. Phys. (Bowdon), H. W. Phillips, L.M.S., S.A. (Delamere), G. Heathcote, L.R.C.P. & S. Access—Bowdon: Altrincham station, ½ mile. Delamere: Mouldsworth or Frodsham, 3½ miles.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis) Sec., A. Nash, 13, Charing Cross, S.W. Access — Margate West, ¼ mile. *See also p.* 906

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Access—Wells station, 2¾ miles. *See also p.* 908

Mendip Hills.—*Nordrach-upon-Mendip*, Blagdon, near Bristol. Res. Phys., R. Thurnam, M.D. Access —Burrington station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium.* Res. Med. Supt. N. D. Bardswell, M.D.

Nayland (Suffolk). — *East Anglian Sanatorium*, and *Maltings Farm Sanatorium* for poor men and women patients. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Access—Bures station, G.E.R., 3½ miles.

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenaften. Med. Supt., E. E. Prest, M.D.

Norfolk.—*Kelling Sanatorium*, Holt. Assistance given to poor patients unable to pay. Hon. Sec., Dr. H. W. McConnel. Res. Med. Off., Mr. W. J. Fanning. Access—Holt station, Norwich, 1½ miles.

Mundesley Sanatorium, Mundesley. Res. Physician, S. Vere Pearson, M.B. Access—Mundesley station, 1 mile.

Northallerton (Yorks). — *Applegarth Sanatorium*, Osmotherley. Res. Med. Prop., H. B. Luard, F.R.C.S. Access—Northallerton, N.E.R., 8 miles, Trenholme Bar, 4 miles. *See also p.* 908

Nottingham.—*Sherwood Forest Sanatorium*, Mansfield, for persons of limited means, resident in Notts and district. Sec., G. Sheldon, 36*a*, Bridlesmith Gate, Nottingham. Res. Med. Off., Dr. Helen I. Moss. Access — Mansfield, 3 miles. Free, or 10/- per week, on recommendation of subscribers.

Oban, Scotland. — *Argyll County Sanatorium.* Med. Supt., Duncan MacDonald, M.D.

Ockley *Sanatorium* (Surrey). Res. Phys., Dr. Clara Hind. Access—Ockley, L.B. & S.C.R., 1 mile.

Painswick (Glouc'stershire).—*Painswick Sanatorium, Cotswold Hills.* Res. Phys. and Prop., W. McCall, M.D. Access — Stroud, 4 miles; Gloucester, 6 miles.

Peebles.—*Manor Valley Sanatorium*, for patients of the middle class with limited means. Apply Medical Superintendent.

Penmaenmawr (N. Wales).—*Nordrach in Wales, Pendyffryn Hall.* Res. Med. Prop., Dr. G. Morton Wilson. Access—Penmaenmawr station, 2 miles; Conway, 3 miles.

Peppard Common (Oxon).—*Kingwood Sanatorium*, for ladies; *Maitland Sanatorium*, for working classes. Med. Supt., Dr. Esther Carling. Access—Reading station, 6½ miles.

Ringwood (Hants).—*Linford Sanatorium.* Props. and Res. Phys. R. M. Smyth, M.D., and H. G. Felkin, M.D. Access—Ringwood station, 2½ miles.

Rudgwick (Sussex). — *Rudgwick Sanatorium.* Vis. London Phys., Dr. Annie McCall. Access—Rudgwick station, 5 minutes; Horsham station, 7 miles. *See also p.* 907

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall.* Res. Props., Drs. G. A. Crace-Calvert and C. E. Fish. Access—Ruthin station, 2 miles. *See also p.* 907

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium.* Res. Phys., H. N. Marrett, M.R.C.S. Access—Chelmsford stat., G.E.R., 3½ miles.

Sheffield.—*City Hospital and School for Consumptives.* Med. Supt., H. J. E. H. Williams, M.D.

Skipton (Yorks).—*Eastby Sanatorium*, for males. Conducted by Bradford Board of Guardians. Med. Supt., B. H. Slater, F.R.C.S. Res. Med. Off., Dr. Margaret C. Macdonald. Access—Embsay station, 2 miles.

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Hon. Sec., Geo. E. Hopwood. Res. Phys., T. Gambier, M.D. Fee, 10/- weekly, with subscriber's letter, available 4 weeks. Access—West St. Leonards S.E.R., West Marina L.B. and S.C.R., within 5 minutes' walk.

Threlkeld (Cumberland). — *Blencathra Sanatorium.* Res.Med. Supt., Dr. W. Goodchild. Access—Threlkeld, C.K. & P.R. 2 miles.

Torquay.—*Mildmay Consumptive Home* for advanced cases only. Hon. Med. Offs., F. D. Crowdy, M.D., and H. P. Wiggin, M.R.C.S. Hon. Sec., Miss F. Gumbleton, Connemara, Torquay. Access—Torquay, 1 mile. Fees, 10/6 weekly, or 7/- with subscriber's letter.

Western Hospital. Open Oct. to May. Sec. F. Manley. Terms, 7/9 by nomination, 12/6 without.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium.* Res. Phys., B. H. Steede, M.D. Access—Warrenpoint. *See also p.* 909

Wicklow.—*Altadore Sanatorium,* Kilpedder, Co. Wicklow. Res. Phys., Dr. J. C. Smyth. Access—Dublin to Greystones, from which it is 5 miles.

The Royal National Hospital for Consumption for Ireland, Newcastle, Wicklow. Hon. Sec., J. R. Orpen, 13, South Frederick Street, Dublin. Res. Phys., L. T. Burra, M.B. Access—D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles. Minimum fees, 7/- weekly, on subscriber's recommendation and medical examination.

Winsley, near Bath.—*Winsley Sanatorium.* For residents in the Counties of Bristol, Gloucester, Somerset and Wilts. Res. Med. Off., Leonard Crossley, M.D. Sec., Frederic Jones. Access—Limpley Stoke station, 1 mile.

Wokingham.—*London Open-air Sanatorium,* Pinewood. Sec., H. W. Harris, 20, Hanover Square, W. Access—Wellington College, S.E.R., 2 miles; or Wokingham, S.W.R., 3½ miles.

Yelverton (South Devon). *Udal Torre Sanatorium.* Res. Med. Supt. and Prop., J. Penn Milton, M.R.C.S.

INSTITUTIONS FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879–1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an "Inebriate" within the meaning of the Acts.

* NOTE:—Ashford and Chiswick are Roman Catholic Religious Institutions.
† Cinderford, Cradley Heath, Herne Hill, King's Lynn, and Torquay, are C.E.T.S. Institutions.

MALES ONLY.

Buntingford (Herts). — *Buntingford House Retreat.* Two Res. Physicians. Access—Buntingford, G.E.R., 8 minutes. *See also p.* 915

Cinderford† (Glos.).—*Abbotswood House Inebriate Retreat.* Res. Hon. Supt., F. Eardley-Wilmot. Access—Ruspidge or Newnham.

Cockermouth (Cumberland). — *The Ghyll Retreat.* Res. Med. Prop., Dr. Cooper. Access—Cockermouth, 11 miles. *See also p.* 912

Colinsburgh (Fife).—*Invernith Lodge.* Res. Med. Supt. and Licensee, Dr. W. H. Bryce. Access—Kilconquhar station, 4½ miles. *See also p.* 911

Dinas Mawddwy (Merionethshire).—*Plas-yn-Dinas.* Res. Med. Supt. and Licensee, Dr. W. F. Walker, J.P. Access—Cemmes Road, 8 miles; Dolgelly, 9 miles. *See also p.* 913

Folkestone.—*Capel Lodge,* near Folkstone. Res. Prop., E. Norton, M.D. Access — Folkestone Junction, 2 miles.

Rickmansworth (Herts).—*Dalrymple House.* Res. Med. Supt., F. S. D. Hogg, M.R.C.S., L.R.C.P. Access—Rickmansworth station, Great Central & Metropolitan Railway, ½ mile; L. & N.W.R., 1 mile. *See also p.* 914

FEMALES ONLY.

Ashford, near Staines.*—*Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply to the Mother Superior. Access—Ashford station, 1 mile. *See also p.* 910

Beverley (E. Yorks).—*Albion House.* Res. Supt., the Matron. Hon. Sec., Mrs. T. R. Pentit, The Limes, Sutton-on-Hull. Hon. Phys., Geo. Savege, M.D.

Brighton.—*Park Gate*, Preston Road. Lady Supt., Sister Mary. Med. Off., R. J. Ryle, M.D., J.P.

Chiswick.*—*St. Veronica's Retreat.* Under the care of the Sisters of Nazareth. Med. Supt., John J. Atteridge, M.D. Access—Chiswick station, ½ mile.

Dairsie, by Cupar (Fife).—*Invereden Lodge.* Res. Phys., Dr. J. Q. Donald. Access—Cupar station.
See also p. 910

Erdington, nr. Birmingham.—*Corngreaves Lodge.* Lic., Miss E. Eaves. Hon. Secretary, J. H. Broscomb, Lyncourt, Kingsbury Road, Erdington, Warwickshire. Access—Gravelly Hill station, ¼ mile.

Fallowfield. — *The Grove Retreat*, near Manchester. Licensee, Mrs. M. Hughes. Med. Offs., A. T. Wilkinson, M.D., J. W. Hamill, M.D., G. Ashton, M.D., and Dr. Florence Robinson. Hon. Treas., S. Gamble. Access—Fallowfield station, 10 minutes. *See also p.* 912

Herne Hill.†—*Ellison Lodge*, Half Moon Lane. Res. Supt., Miss Corner. Med. Supt., Dr. T. H. Underhill. Access—Herne Hill, 10 minutes.

King's Lynn† (Terrington, St. Clement's). — *Hamond Lodge.* Res. Supt., the Sister in Charge. Med. Supt., S. R. Lister, M.R.C.S. Access—Terrington stat., 1½ miles

Leicester.—*Melbourne House*, Prop., Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D., Camb. London Consultant, F. M. Pierce, M.D., 50, Gordon Square, W. Nat. Tel., 769 Leicester. Station, 2 miles. *See also p.* 910

Newmains (N.B.).–*Newmains Retreat* for ladies. Licensed under Inebriates Acts. Access—Hartwood stat., Cal. Railway. *See also p.* 915

Reigate (Surrey.) — *Duxhurst*, for women of all classes. Supt., Sister in charge. Med. Supt., A. Walters, M.R.C.S. Access—Reigate, 4 miles.

Spelthorne St. Mary (Bedfont, Middlesex). — Apply to Sister Superior, C.S.M.V. Access—Feltham, S.W.R., 1 mile.

Licensed under Inebriates Acts. Females—Primarily Gentlewomen and Middle Class (24). Treatment—Physical, Moral, and Spiritual.
See also p. 915

Torquay.† — *Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, M.D., F.R.C.S. Hon. Sec., Mrs. H. H. Erskine.

Wandsworth. — *Northlands Retreat*, 20, Bolingbroke Grove, Wandsworth Common, S.W. Lics., Dr. J. Round and the Misses Round. Access — Wandsworth Common station.

MALE AND FEMALE.

Bristol. — *Brentry*, Westbury-on-Trym, for cases arising under the Licensing Act, 1902. Res. Supt., Capt. Lay; Med. Off., Dr. Ormerod. Hon. Sec., Rev. H. N. Burden. Access—Clifton Down station, 3½ miles.

REFORMATORIES CERTIFIED UNDER THE INEBRIATES ACT, 1898.

MALE AND FEMALE.

Bristol.—*Brentry certified Inebriate Reformatory*, Westbury-on-Trym. Res. Supt., Capt. Lay; Med. Officer, Dr. Ormerod. Hon. Sec., Rev. H. N. Burden. Access—Clifton Down, Redland, or Patchway station, 3½ miles.

Cattal (Yorkshire).—*Yorkshire Inebriate Reformatory*, Cattal, near York. For Yorkshire cases. Res. Supt. and Med. Off., Dr. F. P. Hearder. Access—Cattal, 1 mile.

FEMALES ONLY.

Ackworth (Yorkshire).—*North Midlands Inebriate Reformatory.* Res. Supt., the Officer in Charge. Med. Off., Dr. Oyston. Access—Ackworth station, 1½ miles.

Bristol.—*Royal Victoria Home*, Horfield. Med. Off., Dr. W. Cotton. Hon. Sec., Rev. H. N. Burden. Access—Montpelier and Bristol stations.

Chesterfield (Derbyshire).—*Midland Counties Inebriate Reformatory*, Whittington. Med. Off., Dr. A. M. Palmer. Access—Whittington station, ½ mile; Chesterfield, 5 miles.

East Harling (Norfolk). — *Eastern Counties Inebriate Reformatory*, East Harling, near Thetford. Res. Med. Supt., Dr. Fleck. Access—Harling Road station, 3½ miles.

Horley (Surrey).—*Farmfield*. For London cases, under Sec. II of the Act. Res. Supt., Miss Forsyth. Med. Off., Dr. C. F. Williamson. Access—Horley station, 2½ miles.

Langho (Lancashire). — *Lancashire Inebriate Reformatory*, Langho, near Blackburn. For Lancashire cases. Res. Supt. and Med. Off., Dr. F. A. Gill. Access—Langho station, 1½ miles.

Lewes (Sussex).—*Southern Counties Inebriate Reformatory*, St. Anns, Lewes. Res. Supt., the Officer in Charge. Med. Off., Dr. W. A. Dow. Access—Lewes station, 1 mile.

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium*, The Mansion, Beckenham Park. Med. Supt., F. Hare, M.D. Access — Beckenham Junction station, 10 minutes.

See also p. 912

Carnoustie (N.B.)—*The Lodge*. Apply to the Secretary.

Durham.—24, Allergate, for friendless and inebriate women; 4/- per week. Hon. Sec., Miss King. Med. Supt., Dr. Robson. Access—Durham, ½ mile.

Edinburgh.—*Queensberry Lodge*, for ladies. Supt., A. Miller. Med. Supt., Dr. William Russell. Access—Waverley station, ½ mile.

See also p. 914

Hounslow (Middlesex).—*West Holme*, for middle class and working women. Med. Supt., Dr. G. A. S. Gordon. Access—S.W. & Dist. Rly., ¼ mile.

Huddersfield (Yorks).—*High Flatts Sanatorium*, for ladies. Matron, Miss F. Peake. Access—Denby Dale, 1½ miles.

Leicester.—*Tower House*, for ladies. Prop., Mrs. Mills. Med. Attendant, A. V. Clarke, M.D. Access—Leicester station, 1½ miles.

See also p. 914

Liverpool.—*Temperance Home*, 318, Upper Parliament Street, for women. Supt., Miss A. J. Wilson. Med. Officer, C. E. Soloman, M.D. Access—Edge Hill station.

Maldon, (Essex).—*Osea Island Sanatorium*, for ladies and gentlemen. Res. Med. Supt., Dr. H. A. Reed. Prop., F. N. Charrington, Esq. Access—Maldon East station.

Norwich. — *Dadson Nursing Home*. Philanthropic home for working class men and women. Apply to office of Dadson Nursing Homes, 14, Hills Place, Oxford Street, W. Med. Supt., Dr. J. M. G. Bremner.

HYDROPATHIC ESTABLISHMENTS.

We wish to make this list complete, but it is impossible when some Proprietors do not return our letter of enquiry, which is *stamped for reply*. This will account for some omissions in the present edition.

Aberdeen. — *Deeside Hydropathic*, Murtle, near Aberdeen. Res. Med. Supt., Alexander Stewart, M.D., LL.D., F.S.Sc. Access—Rail to Aberdeen, thence to Murtle station on the Deeside line, 5 miles from Aberdeen; from this station, 8 minutes.

See also p. 930

Baslow.—*Grand Hotel and Hydro*. Access—Bakewell station, 4½ miles; Grindleford, 5 miles.

Ben Rhydding. — *Ben Rhydding Hydro*. Phys., Thos. Scott, M.D., and Dr. W. R. Bates. Access—Station, a few hundred yards.

Bexhill-on-Sea.—*Wilton Court Hotel and Hydro*. Manageress, Mrs. W. Purrott.

Blackpool.—*Matlock Hydro & Boarding House*, Station Road. Access—3 minutes' walk from South Shore station.

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Phys., W. J. Smyth, M.D. Access—East station, 1½ mile; West station, ¼ mile.

Linden Hall Hydropathic. Man. Director, J. T. Exton.

Bridge of Allan.—*Bridge of Allan Hydropathic Co.* Manageress, Miss McNeill. Vis. Phys., Dr. Haldane. Access—Station, ¼ mile.

Bristol. — *The Bristol Hydropathic* (formerly Bartholomew's Turkish Baths), College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S.

Bute.—*Kyles of Bute Hydropathic,* Port Bannantyne, Rothesay. Man., A. Menzies. Med. Supt., Dr. A. J. Hall. Access—Clyde steamers call daily.

Buxton.—*Buxton Hydro.* Manager, G. W. Bosworth. Access—Station, 4 minutes.

Corbar Hill Hydro, Clarendon House. Man., Miss L. Adams. Access—Buxton station, 5 minutes.

Haddon Hall Hydro. Prop., Mrs. G. E. Hall.

The Peak Hydro. Man., Miss Withers. Med. Supt., Dr. Braithwaite. Access—Buxton station.

Callander, N.B.—*Callander and Trossachs Hydro.* Apply, Proprs.

Caterham (Surrey). — *Surrey Hills Hydropathic.* Res. Med. Supt., A. B. Olsen, M.D. Access—Caterham station

Clifton (near Bristol).—*Clifton Grand Spa and Hydropathic.* Access—Clifton Down station, 1 mile; Bristol station, 1½ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Phys., M. Orb, M.D. Access—Blarney station, 2½ miles; Muskerry Light Railway from Cork, station on grounds.

Crieff.—*Strathearn House* (17 miles from Perth). Res. Med. Supts., Thos. H. Meikle, M.D., J.P., and T. Gordon Meikle, M.B., C.M. Access—Crieff station, 1 mile.

Dunblane.—*Philp's Dunblane Hydropathic,* Perthshire. Res. Phys., Dr. S. M. Sloan. Access—Dunblane station, ¾ mile.

Eastbourne. — *Eastbourne Hydropathic.* Man., W. J. Grimes.

Edinburgh.—*Hydropathic,* Slateford. J. Bell, Man. Dir. Access—Merchiston, 1 mile; Waverley, 3 miles.

Eversley (Hants). — *Bad-Nauheim* Kuranstalt for the treatment of heart, nervous and rheumatic affections. Director, J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Fleet, 6 miles.
See also p. 909

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Access—Forres station, 1 mile; Inverness, 24 miles.

Grange-over-Sands. — *Hazelwood Hydropathic.* Physicians, Richard Lowther, M.D., and Owen Gwatkin, M.R.C.S. Access—Carnforth, L. & N.W.R., and thence by Furness Railway; Grange-over-Sands, ¼ mile.

Harrogate (Yorkshire).—*The Cairn Hydropathic.* Near Leeds and Bradford. Man., Mrs. Baker. Access—Harrogate station, ½ mile. 5 minutes from Royal Baths and Pump Room.
See also p. 925

The Harlow Manor Hydro. Man., Miss Oakley. Med. Supt., Dr. Dimmock.

The Harrogate Hydropathic. Phys., Drs. T. Johnstone and R. McLeod Veitch. Access—Harrogate station, ½ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. Stewart. Access—Hexham, 1 mile; Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med. Supt., Chas. Toller, M.D. Apply to the Secretary. Station, 1 mile.

Ilkley (Yorkshire). — *Craiglands Hydro., Lim.* Res. Med. Supt., Henry Dobson, M.D., C.M.

Ilkley Wells Hydro. Manageress, Miss Fender. Access — Ilkley station, ¼ mile.

The Spa Hydropathic, near Leeds and Bradford. Manageress, Miss Pugsley. Med. Supt., Dr. T. B. Hearder. Access—Ilkley, 3 mins.

Ilkley, *continued.*

Troutbeck Hydro. Manageress, Miss Moorhouse.

Isle of Man.—*Ramsey Hydro.*, Ramsey (about 16 miles from Douglas). Med. Supt., Dr. H. C. Sugden. Access—Ramsey, 10 minutes.

Kilmacolm (Renfrewshire).—*Hydropathic.* Access—Greenock, 7 miles; Glasgow, 16 miles, G. & S.W.R.

Leicester.—*The Leicester Sanitarium*, 82, Regent Road. Med. Supt., A. B. Olsen, M.D.

Limpley Stoke (near Bath).—*West of England Hydropathic.* Res. Med. Supt., Dr. W. W. Taunton. Access—Limpley Stoke station.

Lincoln.—*Northcote Hydro.*, Woodhall Spa. Med. Supt., R. Cuffe, M.R.C.S.

Llandudno.—*Hydropathic and Winter Residence.* Med. Supt., James Craig, M.B. Access—Llandudno station, 5 minutes.

Malvern.—*The Malvern Hydropathic.* Res. Prop., Dr. J. N. F. Fergusson. Access—Great Malvern station, ¼ mile. *See also p.* 926

Wyche-side Hydropathic. Res. Phys., Dr. Grindrod. Access—Malvern Wells station, G.W.R., ½ mile; Great Malvern station, 2 miles.

Matlock.—*Matlock House Hydropathic*, Matlock. Physician, W. Moxon, M.D., J.P. Access—Matlock, M.R., ¼ mile.

Rockside Hydropathic, Matlock. Med. Supts., Drs. A. L'Estrange Orme and Marie Goodwin. Access—Matlock, ¾ mile. *See also p.* 931

Royal Hotel and Baths, Matlock Bath. Phys., W. C. Sharpe, M.D. Access—Matlock Bath station.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Access—Matlock station, ½ mile; omnibus. *See also p.* 929

Melrose.—*Waverley Hydropathic.* Con. Phys., Drs. Calvert and MacMillan. Access—Melrose station, 1 mile.

Moffat.—*The Moffat Hydropathic.* Man., Miss Gardner. Med. Supt., Dr. Huskie. Access—Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic.* Complete modern equipment of baths and electrical treatment. Plombières treatment for mucous colitis, and Bourbon Lancy treatment for heart disease. Fango di Battaglia (Mud packs for sciatica, etc.) Res. Phys., Thomas D. Luke, M.D., F.R.C.S.Edin. *See also p.* 927

Rostrevor (Co. Down).—*Rostrevor Hills Hydropathic.* Res. Med. Supt., Horace J. Williams, M.D. Access—Warrenpoint station, 2½ miles.

Rothesay.—*Glenburn Hydropathic.* Med. Supt., Dr. Marshall. Access—Wemyss Bay, ½ hour's sail.

Scarborough.—*Hydro.* Access—Scarborough. N.E.R., ¼ hour.

Shandon.—*Shandon Hydropathic.* Consulting Phys., Dr. Wm. R. Sewell. Access—Shandon station, 5 mins.

Skelmorlie.—*Wemyss Bay Hydropathic.* Med. Supt., Dr. W. C. Philp. Access—Wemyss Bay station, ½ mile. *See also p.* 930

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. *See also p.* 922

Kenworthy's Hydropathic, 51, Bath Street. Phys., Dr. Kenworthy. Access—Chapel Street (L. & Y.), Lord St. (Cheshire Lines) ¼ mile.

Sunnyside Hydropathic Compy. Man., J. Marshall. Access—Southport stations, ½ mile.

Tunbridge Wells.—*The Spa Hotel.* Access—Station, about 1 mile; London, 34 miles. Prop., H. R. Willats. *See also p.* 932

Ulverston.—*Conishead Priory Hydropathic.* Med. Supt., Dr. Ashburner. Access—Ulverston station, 1¾ mls.

Watford.—*The Hall*, Bushey. Man., Col. Coyne. Med. Supt., Dr. F. Smith. Access—L. & N.W., 1 mile.

Windermere.—*Windermere Hydropathic.* Access—Windermere, L. & N.W.R. 1 mile.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS.

Bournemouth.—*Victoria Nurses' Institute and Home Hospital*, Cambridge Road. Matron, C. Forrest. Access—Bournemouth West stat. *See also p.* 900

Bristol.—*General Hospital.* Matron, Miss A. Densham. Sec., Wm. Thwaites. *See also p.* 897.

Cheltenham. — *General Hospital* Private Nursing Staff. Matron Miss G. Möller. *See also p.* 898

Leeds.—*Trained Nurses' Institution*, 21, Hyde Terrace. For Trained Nurses and Masseuses. Apply Superintendent. *See also p.* 897

Liverpool. — *Liverpool Nurses' Co-operation and Medical and Surgical Home*, 3, Canning Street. Lady Supt., Miss Geach. *See also p.* 902

London.—*Baker Street Association of Hospital-Trained Nurses*, 15, Baker Street, and 1, Fitzroy Street, W. Supt., Miss Masters. *See also p.* 898

Hooper's (Miss) Trained Nurses' Institute, 9, Upper Baker St., N.W. Also at 35, Holmdale Road, West Hampstead, N.W. *See also p.* 898

National Hospital Male Nurses' Association, Queen Square, W.C. Apply to Lady Superintendent. Telephone No. 4594 Central. *See also p.* 896

St. Luke's Hospital, Old Street, E.C. Trained Nurses for Mental, Nervous and Massage Cases. Apply Matron. *See also p.* 897

Temperance Male Nurses' Co-operation, Ltd., 43, New Cavendish Street, W.; also at Manchester and Glasgow. Secretary, M. D. Gold. *See also p.* xl

Wigmore Nurses' Co-operation and Medical and Surgical Nursing Home, 59, Weymouth Street, W. Lady Supt., Mrs. Gibbins. *See also p.* 898

Sunderland. — *Nursing Inst. and Home for Trained Nurses.* Matron, Miss C. Aldis.

Thoroughly reliable Nurses supplied for Medical, Surgical, Mental, and Maternity cases.

PRIVATE HOMES FOR INVALIDS.

Bath.—*Lansdown Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Med. Supts., Dr. Percy Wilde, and Dr. Wells-Beville. Access—M.R. or G.W.R. station, Bath, about 1 mile *See also p.* 901

Alderley Edge (Cheshire). — *The David Lewis Colony* (for Epileptics). Director, Alan McDougall, M.D., Warford, near Alderley Edge. *See also p.* 904

Billericay (Essex).—*New Lodge* (for gentlemen suffering from epilepsy and mental deficiency). Conducted by the Co-operative Sanatoria, Ltd. *See also p.* 947

Bournemouth.—*St. Luke's Homes* for Epileptic Churchwomen, 36, Parkwood Road; also at Swanmore, Isle of Wight. *See also p.* 904

Bournemouth. — *Victoria Nursing Institute and Home*, Cambridge Road (for paying patients). Apply the Matron. *See also p.* 900

Buxton. — *Corbar Tower*, Dietetic and Medical Home. Apply Mrs. Owen. Access—Station, Pump Room and Baths, 10 minutes' walk. *See also p.* 905

Chorley Wood (Herts.).—*The Laburnums*, Heronsgate. Private Home for epileptic, paralytic, and other cases. Apply, Miss King. Access—Chorley Wood station, 1½ miles. *See also p.* 904

Eversley (Hants).—*Glencote* (Sanatorium for Non-tubercular cases). Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Fleet, 6 miles.
See also p. 909

Gerrard's Cross (Bucks).—*Oakhain*, North Park. Nursing and Convalescent Home. Principal, Mrs. M. J. Waring. *See also p.* 899

Hadlow Down, Buxted (Sussex).—*South Beacon* (for the care and treatment of gentlemen mentally affected, but not ill enough to be certified). Prop., Philip H. Harmer. Access—Buxted, 3 miles; Mayfield, 4 miles; Heathfield 4 miles.
See also p. 900

Haslemere, Surrey.—*Haslemere Nursing Home, "Courtsfold."* Medical, Weir-Mitchell, Rest Cure, and Chronic cases received. Apply to the Misses Ringwood and Inge. Tel. No. 22. *See also p.* 900

Jedburgh.—*Abbey Green*. Res. Prop., Wm. Blair, M.D. Access—N.B.R., Jedburgh. Tel. No. 3. *See also p.* 904

Jersey.—*Pinehurst Nursing Home*. Med. Supt., Dr. Symons, Beaumont, Jersey. Secretary, Miss Oxenden.
For any kind of delicacy, or first stages of threatened phthisis.

London.—*Manna Mead*, 17, The Grove, Blackheath, S.E. (for invalids and convalescents). Principals, Mrs. Knight and Miss Tapley Spurr. Access—Lewisham Junction, 15 mins. walk. *See also p.* 899

London.—*St. Thomas's Home*, St. Thomas's Hospital, Westminster Bridge. Apply, Sydney Phillips, B.A., St. Thomas's Hospital, S.E. Access — Waterloo, 5 minutes. Tel.: Hop. 1637. *See also p.* 901

Minehead (Som.).—*Blair Lodge* (for slight mental cases, etc.) Apply to Sisters Heather. *See also p.* 904

Ryde (Isle of Wight). — *Crescent House* (for treatment of paralysis, neurasthenia, osteo-arthritis and neuralgia. Apply, Dr. G. M. Lowe.
See also p. 900

Stanmore (Middlesex).—SCARLET FEVER *Convalescent Home* (*The Mary Wardell*). Vis. Phys., A. Muir, M.D. Hon. Sec., Miss M. Wardell. Access — Stanmore, 2 miles. *See also p.* 901

Stroud (Glos.). — *Cranham Wood Nursing Home*, near Stroud. Res. Phys., Dr. F. Kincaid Etlinger. Access—Stroud station, 7 miles.
See also p. 896

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

Bath (Somersetshire).—Sheltered from the N. and N.E. winds by a range of hills from 600 to 800 feet high; 2 hours from London (Paddington), 12 miles from Bristol. Average rainfall 30·79 inches. Climate mild and equable.

Waters.—The only hot springs in Great Britain. Three springs, known respectively as "The Hot Spring or Old Royal," 120° F.; "The King's Bath Spring," 114° F., used for drinking purposes, and "The Cross Bath Spring." The waters contain sulphates of calcium, strontium, sodium, and potassium, with calcium carbonate, the chlorides of magnesium, sodium, and lithium, etc. They are strongly radio-active, and the rare gases, krypton and xenon, have recently been discovered in the waters.

Therapeutic indications.—Gout, chronic rheumatism, rheumatoid arthritis, sciatica, disorders of the digestive organs, anæmia, skin diseases, nervous disorders and debility.

Baths.—Modern baths of every description, including Aix massage douche, deep baths, electric, water and hot air, natural vapour, needle, intestinal douches for muco-membranous colitis and similar conditions, sulphur, Nauheim, and swimming baths (*See p.* 919).

Bridge of Allan (Stirlingshire).—Three miles north of Stirling. Sheltered from the North and East winds by the Ochil Hills. On the direct route to London, and within an hour's rail journey of Edinburgh and Glasgow. Climate mild and equable.

Waters.—Natural mineral waters from six springs at a depth of about 116 feet, exceedingly rich in saline, the chief ingredients being various salts of calcium, sodium, and magnesium.

Therapeutic Indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, and in rheumatism, gout, sciatica, and other nerve affections, also diseases of the skin.

Buxton (Derbyshire).—1000 feet above sea level, 3½ hours from London (St. Pancras), 23 miles from Manchester, 30 from Sheffield, 53 from Liverpool. Bracing climate. Lowest absolute humidity of any health resort in Great Britain.

Waters.—Thermal springs 82° F. Powerful radio-active properties. More highly charged with nitrogen gas than any other spring. Chalybeate spring.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, nervous diseases, skin diseases, especially those of gouty origin, malaria and other tropical diseases, colitis, anæmia, phlebitis, and diseases of women.

Baths.—Recently extended. Immersion, douche, vapour, douche-massage. Complete electrical department. Moor baths. Plombières douches. Chalybeate baths, and carbonic acid gas baths.

Cheltenham (Gloucestershire).—250 feet above sea level, 3 hours from London. Rainfall about 27 inches. Protected from N. and N.E. winds.

Waters.—The mineral waters are of two kinds. One is alkaline from contained soda carbonate, the other is impregnated with the sulphates of soda and magnesia. They are now receiving considerable attention from the medical profession, and seem likely to successfully compete with Carlsbad and Marienbad in attracting a portion of the patients formerly sent abroad.

Therapeutic indications.—Gout, dyspepsia, dietetic disorders generally, neurasthenia, and other conditions.

Baths.—Good modern baths, with massage (*See p.* 932).

Hotel.—The Queen's Hotel (*See p.* 920).

Church Stretton (Salop).—613 feet above sea level, in the "Highlands of England," 4¼ hours from Euston or Paddington, 1½ hours from Birmingham, 2½ hours from Liverpool and Manchester, and 2 hours from Bristol. Air noted for its extreme purity, bracing, with a somewhat tranquillizing influence, and a generally invigorating climate. Hills 1,250 to 1,700 feet high. Prevailing wind, S.W. Rainfall, 32 inches. Modern drainage. Porous soil. Death-rate in 1908, 5·1 per 1,000. Practically no infectious diseases and no influenza.

Waters.—Said to be the purest in England; useful in gout, rheumatism, chronic renal affections, and arteriosclerosis.

Therapeutic indications.—The "open-air" cure of neurasthenia, sequelæ of influenza, insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork and convalescence after illness or operation.

Hotel.—The Longmynd Hotel (*See p.* 920).

Droitwich (Worcestershire.)—150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 23 inches. Mean winter temperature 47° F., summer 69·9° F. Well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (channel), containing in every gallon 20,000 grains of saline in excess of any known waters: the waters possess radio-active properties.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, neuralgia, heart diseases, especially those of myocardium—effect similar to Nauheim treatment,—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, skin diseases of a dry, scaly nature, e.g., chronic eczema and psoriasis.

Droitwich, *continued.*

Baths.—Immersion, douche, needle, vapour, and swimming; and to be completed early in the present year, Aix-douche, Nauheim baths, etc.

Hotel.—Worcestershire Brine Baths Hotel, and Brine Baths (*See p.* 928).

Harrogate (Yorkshire).—450 feet above sea level, 4 hours from London, 17 miles from Leeds, 20 from York. The climate is stimulating and fairly dry—bracing moorland air.

Waters.—Celebrated for the medicinal properties of its 80 springs—sulphurous, chalybeate, saline, etc.

Therapeutic indications.—Anæmia, chlorosis, gout, rheumatism, disorders of liver and stomach, muco-membranous colitis, chronic appendicitis, and skin diseases.

Baths.—There are four establishments, where numerous treatments are given, including sulphur baths, douche, Nauheim, vapour, Russian, Turkish, electric, mineral, electric light, ozone, etc.

Hydropathic Establishment.—The Cairn Hydropathic (*See p.* 925).

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, rising rapidly from the bank of the river to a height of 750 feet above sea level; distant 16 miles from Leeds, 14 from Bradford, and 18 from Harrogate. Occupying a sheltered position. The annual rainfall, 35 inches, is considerably less than on the other side of the river, with fewer rainy days. Mean annual temperature 48° F. Being in close proximity to extensive moors the air is bracing and exhilarating and at the same time dry and soft, having a wonderfully restorative effect upon invalids.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling, and does not act on lead. Chalybeate waters.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments.

Leamington Spa (Warwickshire).—170 feet above sea level, 1 hour 50 minutes from London (Paddington or Euston), 24 miles from Birmingham. Equable and mild climate.

Waters.—Saline—chalybeate. Resembling those of Homburg, but are more generally useful. Metchnikoff's soured milk is prepared daily from pure cultures from the Municipal Laboratories, and can be taken at the Royal Pump Room or at home.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylopoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension and chronic interstitial nephritis.

Baths.—Turkish, medicated, swimming, and electric of all kinds.

Llandrindod Wells (Radnorshire). — Situated in Central Wales, at an altitude of 750 feet. About 5 hours from London on the L. & N.W. Ry. It lies in the centre of a plateau of hills rising in places to over 2000 feet. Sheltered from the east, and open to the south and west. The soil is porous, and dries up quickly after rain. The climate is extremely bracing.

Waters.—There are a great variety of mineral waters—sodium chloride, sulphur, iron, magnesium, chloride of calcium, and lithia springs similar in composition to those at Kissengen, Homburg, and Contrexéville. Slightly aperient and strongly diuretic.

Therapeutic indications.—The diseases most benefited are those in which any digestive derangements are present, the various forms of gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus, or any kidney or bladder condition requiring diuresis, neurasthenia, or debility from over-work or convalescence. (*See also p.* 922.)

Hotel.—The Rock House Hotel (*See p.* 920).

Llangammarch Wells (Breconshire).—In an open valley surrounded by moorland, 600 feet above sea level. On the L. and N.W.Ry., 5¾ hours from London, 4 from Manchester, 4¼ from Liverpool. Mean annual temperature 47·5° F., summer 55·4° F. Well protected from the east.

Water.—Saline, containing the chlorides of barium, calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles. The barium salt has a physiological action on cardiac muscle similar to that of digitalis and strophanthus, and is also a good diuretic. Administered both internally and externally. Temperature 56° F.; is heated for bathing purposes. A modified Nauheim system of baths, exercises, massage, and hill climbing is carried out.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Baths.—Immersion, douche, and needle.

Hotel.—Lake Hotel and Bungalow Private Hotel (*See p.* 923).

Malvern (Worcestershire).—Situated at a mean altitude of 500 ft. above sea level, on eastern slope of Malvern Hills (9 miles long and rising to 1400 ft.), 2¾ hours from London (Paddington), and about 1 hour from Birmingham. Original home of hydropathy. Soil gravelly (syenitic detritus). Air dry and b acing, cool in summer and warm in winter. Mean annual temperature 49·58, with low daily variation. Lowest death rate of any inland watering place. Sanitation perfect.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

Therapeutic Indications.—Gout, rheumatism, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic and cutaneous diseases.

Hydropathic Establishment.—Dr. Fergusson's Hydropathic (*See p.* 926).

Hotel.—The Imperial Hotel (*See p.* 924).

Matlock Bath (Derbyshire).—300 to 800 ft. above sea level, 3½ hours from London (St. Pancras), 46 miles from Manchester, 16 from Derby. Rainfall 29 inches. One of the most sheltered towns in England.

Waters.—Thermal Springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate. Owing to its peculiarly soft and unctuous character it is especially valuable in bathing and douche operations, particularly those associated with massage, such as those known as the "Aix" and "Vichy" douches.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, and digestive and bilious disorders.

Baths, etc.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Fango-di-Battaglia.—The volcanic mineral deposit from the hot springs near Padua (N. Italy) is imported, and extensively used in the treatment of gout, rheumatoid arthritis, and neuritis.

Matlock Bank (*Matlock* station, one mile by rail from Matlock Bath).—300 to 800 feet above sea level, 3½ hours from London (St. Pancras), 45 miles from Manchester, 17 from Derby. South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal Hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant light and heat, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated and inhalation baths, Aix and Vichy douches, etc.

Matlock, *continued*.

A feature of the Matlock Hydros is, that as a rule they are complete in their own grounds, and contain croquet and tennis lawns, and bowling and putting greens, which, as a means of recreation and exercise, form a valuable auxiliary to a course of hydropathic treatment.

Hydropathic Establishments.—Rockside Hydropathic (*See p.* 931) and Smedley's Hydropathic (*See p.* 929).

Peebles (Peebleshire, N.B.).—500 ft. above sea level. One hour from Edinburgh and 8 from London (via Galashiels). Rainfall 27 inches. Bracing climate but sheltered from the north winds. Mean annual mortality rate 11 per mil. Population 6000 in winter, and 10,000 in summer.

Waters.—The waters are of the halothermal type, similar to Kissengen and Kreuznach. The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronans Well.

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, and in this respect seem likely to compete with the above mentioned continental resorts, patients being saved the long journey, and also, after the baths, are conveyed by lift immediately to their rooms for resting. The waters are also suited to dyspepsia, gout, rheumatism and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango di Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*See p.* 927).

Ripon (Yorkshire).—Situated on rising ground near the junction of the Rivers Ure and Skell. On the N.E. Railway, 4¾ hours from London. 120 feet above sea level. Climate mild but bracing. Soil, gravel and sand, and dries up quickly after rain. Prevailing winds, W. and S.W. Surrounding country well wooded and very beautiful, Fountains Abbey and many other places of interest being within easy reach. The Yorkshire Moors are only a few miles from the City.

Waters.—Saline Sulphur Water brought down from Aldfield Spa, 4 miles distant to the New Baths erected in 1904.

Therapeutic indications.—Chronic and subacute gout and rheumatism, rheumatoid arthritis, skin diseases (eczema, psoriasis, acne, etc.), catarrhs, gastric and liver derangements.

Hotel.—Ripon Spa Hotel (*See p.* 918).

Strathpeffer Spa (Ross-shire).—In the Highlands of Scotland. 180 to 300 feet above sea level. Through carriages twice a week during summer from London, 15 hours, and per the Highland Railway (*see p.* 920). Sheltered from N. and N.E. winds. Prevailing wind S.W. Sandy soil. Bracing air.

Waters.—Sulphurous and chalybeate. Former, very rich in sulphuretted hydrogen gas and sulphates. Four sulphur wells in use: (1) Old well; (2) Upper; (3) Strong; (4) Cromartie. No. 4 contains over 19 cubic inches H_2S to gallon. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic and subacute gout and rheumatism (especially articular), rheumatoid arthritis, chronic skin diseases (eczema, acne, psoriasis, etc.), especially when gouty or rheumatic, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, neurasthenia, anæmia, obesity, chronic metallic poisoning, dilatation of heart, neuritis.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, radiant heat (electric), and high-frequency current.

Hotel.—The Ben Wyvis Hotel (*See p.* 921).

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London, 30 miles from Hastings, Brighton, and Eastbourne. Rainfall 30 inches. Mean winter temperature 41·3° F., summer 55·9° F. Lies upon a bed of

sandstone. Climate is mildly tonic and invigorating. Prevailing winds W. and S.W.

Waters.—Chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Diseases of respiratory organs (bronchitis, asthma, and phthisis), early cardiac cases, diseases of digestive organs, gout and rheumatoid arthritis, and especially diseases of nervous system (neurasthenia and mental depression), as well as in convalescence and infantile disorders. Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, vapour and swimming, medicated and electric light (*See p.* 932).

Hotels.—Royal Mount Ephraim Hotel (*See p.* 933), and Spa Hotel (*See p.* 932).

Woodhall Spa (Lincolnshire).—Built upon ironstone sand, through which the surface water percolates very rapidly. Midway between Boston and Lincoln, about 3 hours from London (King's Cross). Rainfall 22·66 inches. Air bracing, clear, and uncontaminated, from the moors and pine woods. Excellent water supply.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Chronic articular and muscular rheumatism, gout, sciatica, and lumbago; neuritis, skin diseases, tuberculous diseases, gall-stones, and liver derangements, and diseases peculiar to women.

Baths.—Complete and recently enlarged immersion, shower, lave, and local douches; inhalation, respiration, natural vapour, Russian and Berthollet vapour; Dowsing radiant heat, and light treatment, Nauheim, Aix and Vichy massage douche, electric treatment, and X rays.

Hotel.—Victoria Hotel (*See p.* 918).

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	Tolmers Square Institute, Drummond St., N.W.	*J. Loane, M.R.C.P.*, 13, Great Alie Street, E.	Monday, Wed.; 1
	Eastern Disp., Leman St.		Wednesday; 11
	Christ Church Mission Hall, Shroton St., Marylebone	E. C. Greenwood, L.R.C.P., 19, St. John's Wood Park, N.W.	Friday; 3
	St. Olave's and St. John's Institute, Tooley St., S.E.	V. A. Jaynes, M.R.C.S., .. 157, Jamaica Road, Bermondsey, S.E.	Wednesday; 3
	Royal Free Hospital, Gray's Inn Road, W.C.	Mrs. F. E. Willey, M.D., 12, Devonshire Street, W.	*
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Bristol ..	St. Peter's Hospital, Bristol	*G. S. Page, L.R.C.P.*, .. 78, Old Market Street	Wednesday; 11
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Leeds ..	Leeds General Infirmary ..	Dr. A. T. Bacon, .. Westfield, Hyde Park Rd.	*
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Sheffield ..	Jessop Hospital for Women	Dr. P. E. Barber. .. .. 3, Clarkehouse Road	*
Aberdeen ..	The Public Dispensary ..	Dr. T. Fraser, ... 51, Elmbank Terrace	Wednesday; 2.30
Dundee ..	Royal Infirmary	R. C. Buist, M.D., ... 166, Nethergate	Monday; 2
Edinburgh ..	New Town Dispensary	*J. B. Buist, M.D.*, 1, Clifton Terrace	Friday; 11
	Marshall Street Dispensary		Thursday; 11
	Livingstone Dispensary, 39, Cowgate		Tuesday; 3
	St. Cuthbert's Hall, Riego Street, Tolcross		Thursday; 3
	The Royal Public Dispensary	W. G. A. Robertson, M.D., 26, Minto Street	Wed. & Sat.; 12
Glasgow ..	The Royal Infirmary	Dr. H. H. Borland, 473, Duke Street, Dennistown	Monday; 12 (Women) Thursday; 12 (Men)
	The Western Infirmary	Dr. J. W. Nicol, ... 7, Kersland Terrace	Mon. & Thurs.; 12
Belfast ..	City of Belfast Union Infirm.	Dr. J. McLiesh, ... 91, Great Victoria Street	*
Cork ..	Cork District Hospital ..	W. E. A. Cummins, M.D., .. 17, St. Patrick's Place	*
Dublin ..	45, Upper Sackville Street ..	*Dr. A. N. Montgomery*, .. 45, Upper Sackville Street	Tuesday, Friday; 10
Galway ..	The Dispensary	Dr. M. J. McDonogh, .. Flood Street	*

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Dentists' Register—Annually 3/4—5, New Street Square, E.C.
Dermatology, British Journal of—Monthly 2/-—H. K. Lewis, 136, Gower Street, W.C.
Dublin Journal of Medical Science—20/- per annum.—41, Grafton Street, Dublin.
Edinburgh Medical Journal—Monthly 2/-—St. Giles Street, Edinburgh.
Entomologist—Monthly 6d.—54, Hatton Garden, E.C.
Entomologists' Monthly Magazine—Monthly 6d.—10, Paternoster Row, E.C.
Folia Therapeutica—Quarterly 1/-—83-91, Great Titchfield Street, W.
General Practitioner—Weekly 3d.—418-422, Strand, W.C.
Geological Magazine—Monthly 2/-—37, Soho Square, W.
Glasgow Medical Journal—Monthly 2/-—A. Macdougall. Mitchell St., Glasgow.
Good Health—Monthly 1d.—Simpkin & Co., 23, Paternoster Row, E.C.
Guy's Hospital Gazette—Fortnightly 6d.—Ash & Co., Lim., Henry Street, Bermondsey
Guy's Hospital Reports—Yearly 10/6—7, Great Marlborough Street, W.
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Indian Medical Gazette—Monthly, 21/- per annum—Thacker & Co., 2, Creed Lane, E.C.
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Linnæan Society's Transactions—Irregular, Price varies—Burlington House, Piccadilly, W.
Liverpool Medico-Chirurgical Journal—Half-yearly, 2/6 each—H. K. Lewis, 136, Gower Street, W.C.
London Hospital Gazette—6/- per annum—5, Rupert Street, E.
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Medical Press and Circular—Weekly 5d.; 21/- per annum—Baillière, 8, Henrietta Street, W.C.
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Medical Review—Monthly 1/6—66, Finsbury Pavement, E.C.
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Mental Science, Journal of — Quarterly 5/- — 7, Great Marlborough Street, W.
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Meteorological Society, Quarterly Journal of the Royal—Quarterly 5/-—12 & 14, Long Acre, W.C.
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Middlesex Hospital Journal—5/- per annum—140, Wardour Street, W.
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Nursing Directory—Annually 5/-—83-91, Great Titchfield Street, W.
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Nursing Notes—Monthly 2d.—12, Buckingham Street, W.C.
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Obstetrics and Gynæcology of the British Empire, Journal of—Monthly 2/6—Sherratt & Hughes, 33, Soho Square, W.
Odontological Society, Transactions of—Monthly, during Sessions, 2/6—83 to 89, Great Titchfield Street, W.
Ophthalmic Hospital Reports, The Royal London—At intervals 5/-—J. & A. Churchill, 7, Great Marlborough Street, W.
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Ophthalmological Society's Transactions—Yearly 12/6—J. & A. Churchill 7, Great Marlborough Street, W.
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Public Health—Monthly 1/6—1, Upper Montague Street, W.C.
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Quarterly Journal of Medicine—Quarterly, 8/6—Oxford University Press, Amen Corner, E.C.
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Royal Academy of Medicine in Ireland, Transactions of—Monthly, 20/- per annum—Baillière, 8, Henrietta Sreet, W.C.
Royal Anthropological Institute, Journal of the—Half-yearly 15/-—3, Hanover Square, W.
Royal Dental Hospital Gazette—Quarterly 1/-—83-91, Great Titchfield St.,W.
Royal Microscopical Society, Journal of the—Bi-Monthly 6/-—14, Henrietta Street, W.C.
Royal Sanitary Institute, Journal of the—14/- per annum—12-14, Long Acre, W.C.
Royal Society of Medicine, Proceedings of the—Monthly 7/6—Longmans, Green, & Co., 39, Paternoster Row, E.C.
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Science Progress in the 20th Century—Quarterly 5/-—John Murray, 50a, Albemarle Street, W.
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NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. The following pages are indexed under their respective headings, and any note can be immediately found when required.

NOTES.

Copy here any formula or fact you wish to keep for reference. (These pages are indexed under the word "Notes.")

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FINE LIQUEUR BRANDY.
(20 *YEARS OLD.*) *See Advertisement, page lxiv.*

INSTRUMENTS, APPLIANCES, OR MATERIALS WANTED.

HORLICK'S MALTED MILK. Stands alone in a class by itself. Always ready for use. No Cooking required. Pasteurised. Contains the enzymes of malt in active condition. No Starch. No Sugar. Suitable for Infants from birth.

SEE PAGE LIV.

Free Sample from HORLICK'S MALTED MILK CO., SLOUGH, BUCKS.

— THE —

YORKSHIRE

INSURANCE COMPANY, Ltd.

ESTABLISHED 1824.

Chairman: RIGHT HON. LORD WENLOCK, K.C.B., G.C.S.I., G.C.I.E.

FIRE. ACCIDENT. LIFE.

Loss of Profits through Fire. Trustee and Executor. Annuities.
Endowments for Children, and Leasehold Insurances.
Employers' Liability (including Domestic Servants). Fidelity.
Personal Accident. Burglary. Plate Glass. Live Stock, etc.

RESERVE FUNDS exceed TWO AND A HALF MILLIONS.
CLAIMS PAID exceed SIX MILLIONS.

LIFE INSURANCE
AT THE
LOWEST POSSIBLE COST.

EXAMPLE, AGE 30:—

	£ s. d.
Average rate of 64 British and Colonial Offices ...	2 0 0 %
"Yorkshire" rate	**1 17 3** %

ANNUITIES.

SPECIMEN RATES FOR **£100** PURCHASE MONEY.

	MALES.						FEMALES.					
	60			70			60			70		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
"Yorkshire" ...	**9**	**0**	**0**	**12**	**15**	**0**	**8**	**2**	**6**	**11**	**12**	**0**
Average of other British Offices ...	8	17	0	12	15	0	7	18	4	11	8	2

SEND FOR PROSPECTUSES.

Head Office:
ST. HELEN'S SQUARE, YORK.

London Offices:
BANK BUILDINGS, PRINCES STREET, E.C.
West End: 49, PALL MALL, S.W.
Law Courts: 307, HIGH HOLBORN, W.C

INDEX TO LIFE ASSURANCE OFFICES.

A, *when Established;* B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of* 30, 40, *and* 50; E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices;* P, *Proprietary Offices.*

Those marked with an asterisk (*) in the E column have not sent revised figures for 1909.

Title, Etc., of Office.	A	B	C	D	E
					£
Abstainers and General, Life, Fire, etc., Edmund St., Birmingham. *Act. and Sec.*, R. A. Craig, A.I.A. .. .. P	1883	40/11	55/10	82/3	459,414
Alliance, Fire, Life, Accident, and Annuities, Bartholomew Lane, E.C. *Gen. Man.*, Robert Lewis .. .. P	1824	48/9	64/5	90/9	5,815,882
Atlas, Fire, Life, and Accident, 92, Cheapside, E.C. *Act.*, Robert Cross. *Gen. Man.*, Saml. J. Pipkin .. .. .. P	1808	49/3	63/7	88/8	2,054,316
Australian Mutual Provident Society, Life, Endowments & Annuities, 37, Threadneedle St., E.C. *Res. Sec.*, H. W. Apperly. **Further particulars see page 840.** M	1849	48/2	64/5	89/10	24,522,715
Britannic Assurance Co., Ltd., Life Endowments & House Purchase, Broad Street Corner, Birmingham. *Chairman*, F. T. Jefferson, J.P. *Sec.*, S. J. Port, F.C.I.S. *Asst. Sec.*, J. A. Jefferson, A.I.A. **Further particulars see page 842** .. P	1866	48/6	65/2	94/-	2,167,107
British Equitable, Life, Fire, Accident, Burglary, Employers' Liability 1, 2, 3, Queen St. Place, E.C. *Man.*, Basil May, F.I.A. P	1854	48/8	64/11	91/9	*1,758,362
Caledonian, Fire, Life, Personal Accident and All Illness, Employers' Liability, Burglary, 19, George Street, Edinburgh. *Gen. Man.*, Robert Chapman. London Offices, 82, King William Street, E.C., and 14, Waterloo Place, S.W. .. .. .. P	1805	48/9	64/6	88/6	2,646,856
City of Glasgow, Life, 30, Renfield Street, Glasgow. *Gen. Man.*, William S. Nicol. London Office, 12, King William St., E.C. *Lon. Man.*, J. D. Milne .. P	1838	48/9	64/6	89/10	2,967,940
City Life Assurance Company, Ltd., 6, Paul Street, Finsbury, E.C., Life Assurance and House Purchase. *Man. Director*, M. Gregory. **Further particulars see page 843**	1897	49/1	66/2	94/7	*350,000
Clergy Mutual, Life, 2 & 3, Sanctuary, Westminster. *Act. & Man.*, F. B. Wyatt. *Sec.*, W. N. Neale. **Further particulars see page 841** .. .. M	1829	46/4	62/2	87/4	*4,242,820
Clerical, Medical and General, Life, 15, St. James's Square, and 1, King William Street, E.C. *Act.* and *Sec.*, A. D. Besant P	1824	48/7	66/9	96/3	4,980,017
Colonial Mutual, Life and Annuity, 33, Poultry. *Man.*, Arthur E. Gibbs .. M	1873	47/4	63/2	89/9	3,073,570
Commercial Union, Fire, Life, Marine and Accident, 24, 25, and 26, Cornhill, E.C. *Act.*, H. C. Thiselton .. .. P	1861	47/10	65/2	92/4	3,569,934
Co-operative, Life, Accident, Fidelity, and Fire, Corporation Street, Manchester. *Sec.*, James Odgers. **Further particulars see page 843** .. .. .. P	1867	45/8	61/5	88/4	*105,835
Eagle, Life, 79, Pall Mall, S.W. *Gen. Man.* and *Sec.*, Geo. R. Jellicoe .. P	1807	50/8	65/5	91/4	2,301,182
Economic, Life, 6, New Bridge Street, Blackfriars. *Act. & Sec.*, G. Todd, M.A., F.I.A. M	1823	44/4	59/6	85/5	4,432,283
Edinburgh, Life, Endowments, and Annuities, 26, George Street, Edinburgh. *Man. and Act.*, A Hewat, F.F.A., F.I.A. *Sec.*, T. M. Gardiner. London, 11, King William Street, E.C. *Sec.*, J. J. Bisgood P	1823	47/11	64/2	90/2	4,214,795

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Title, Etc., of Office.	A	B	C	D	E
					£
English and Scottish Law, Life, Annuity, Endowment, and Loan, 12, Waterloo Place, S.W *Gen. Man.*, Albert G. Scott. *Act.* and *Sec.*, John Spencer, F.I.A. .. P	1839	47/1	62/8	87/9	2,850,386
Equitable Life Assurance Society, Mansion House St., E.C. *Act.* & *Sec.*, G. J. Lidstone M	1762	53/5	67/11	90/7	5,053,235
Equity and Law, Life, 18, Lincoln's Inn Fields, W.C. *Act.* and *Sec*, W. P. Phelps, F.I.A., M.A... .. .. P	1844	48/10	64/6	90/9	*4,401,301
Friends' Provident, Life, Annuities, etc., Bradford, Yorkshire. *Sec.*, William H. Gregory. *Act.*, Alfd. Moorhouse, F.I.A. M	1832	48/-	64/-	89/7	3,363,183
General Accident Fire and Life, Perth, Scotland. *Gen. Man.*, F. Norie-Miller, J.P. P	1885	49/2	64/11	91/3	25,332
General, Life, 103, Cannon Street, E.C. *Man.* and *Sec.*, John Robert Freeman. **Further particulars see page 842** P	1837	49/10	65/4	92/8	1,977,984
Gresham, Life, St. Mildred's House, E.C. *Gen. Man.* and *Sec.*, James H. Scott P	1848	48/2	64/1	91/5	9,807,856
Guardian, Fire, Life, Accident, Burglary, Fidelity Guarantee, and Plate Glass, 11, Lombard Street, E.C., & 21, Fleet St. *Sec.*, T. G. C. Browne. *Act.*, Ernest Woods P	1821	48/10	64/6	89/3	4,153,401
Law Life, 187, Fleet Street. *Man.*, E. H. Holt. *Act.*, J. E. Faulks .. P	1823	49/4	64/10	91/-	4,290,175
Law Union and Rock, Life, Fire, Accident, Annuities, Burglary, etc., 126, Chancery Lane. *Gen. Man.*, Alex. Mackay P	1806	48/4	64/-	89/10	7,296,867
Legal and General, Life, and Annuities, 10, Fleet Street, E.C. *Act.* and *Man.*, E. Colquhoun .. .. .. P	1836	50/9	65/11	90/9	5,903,633
Life Association of Scotland, 82, Princes St., Edinburgh. *Man.*, Gordon Douglas. *Sec.* R. M. M. Roddick, London Office, 18, Bishopsgate Street Within, E.C. *Sec.*, J. C. Wardrop .. .. .. P	1838	48/11	64/10	91/1	5,735,517
Liverpool and London and Globe, Fire, Life, Annuities, Accident, etc., 1, Dale St., Liverpool. *Gen. Man.* and *Sec.*, A. G. Dent. London Office, 1, Cornhill, E.C. P	1836	49/10	65/9	91/3	5,199,868
London and Lancashire, Life, 66 and 67, Cornhill, E.C. *Gen. Man.* and *Sec.*, W. Æneas Mackay. *Jnt. Asst. Secs.*, E. E. Dent and L. C. Kestin. *Act.*, Harold Dougharty, A.I.A., F.C.I.S. .. P	1862	46/10	62/4	86/10	2,372,318
London Assurance Corporation, Fire, Life, and Marine, 7, Royal Exchange. *Man.* of Life Dept., James Clunes. *Act.*, A. G. Hemming .. .. P	1720	49/6	64/11	91/5	2,357,242
London, Edinburgh and Glasgow, Life, Industrial, and Accidents, Euston Square, N.W. *Sec.*, T. V. Cowling. *Gen. Man.*, Thos. Neill .. .. P	1881	48/7	64/9	93/4	1,012,144
London Life Association, Lim., 81, King William Street, E.C. *Act.* and *Man.*, C. D. Higham, F.I.A. .. M	1806	60/-	79/-	108/-	4,940,748
Marine and General Mutual, Life, and Marine, 14, Leadenhall Street, E.C. *Act.* and *Sec.*, S. Day, F.I.A. .. .. M	1852	48/10	65/11	91/11	1,653,415
Metropolitan Life, 13, Moorgate St., E.C. *Sec.*, Bernard Woods. *Act.*, H. J. Baker M	1835	49/9	66/4	92/-	2,232,656
Mutual Life and Citizens', 5, Lothbury, Bank, E.C. *Man.*, Alfred Gilbert .. P	1886	48/9	65/3	89/9	4,409,486
Mutual Life Insurance Co. of New York, 16, 17 and 18, Cornhill, E.C. *Gen. Man.*, J. H. Harrison Hogge. *Sec.*, T. Crawford M	1843	48/9	66/-	97/-	109,415,843
National Mutual Life, 39, King Street, Cheapside. *Act.* and *Man.*, Geoffrey Marks, F.I.A. *Sec.*, H. J. Lockwood. *Asst. Act.*, C. R. V. Coutts, F.I.A. M	1830	48/4	63/7	89/6	2,874,623

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Title, Etc., of Office.	A	B	C	D	E
					£
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. *Man.*, John B. Gillison, F.I.A., F.F.A. Further particulars see page 843 M	1869	46/8	61/6	87/2	*4,844,002
National Provident, 48, Gracechurch Street, E.C. *Act.* and *Sec.*, L. F. Hovil M	1835	50/2	66/3	91/1	*6,500,000
New York Life, Trafalgar Buildings, Trafalgar Square, London, W.C. *Sec.*, Wm. R. Collinson, F.C.I.S. .. .. .. M	1845	48/9	66/–	96/11	*14,514,881
North British and Mercantile, Fire, Life, Annuities, Marine, Burglary, Accidents to Servants, &c., 61, Threadneedle St., E.C., and 64, Princes St., Edinburgh. *Life Man.* and *Act.*, London, H. Cockburn. *Jt. Man.*, D. C. Haldeman. *Sec.*, R. Carmichael. Further particulars see page 839 P	1809	49/10	66/1	91/11	14,637,607
Northern Assurance, 1, Moorgate St., E.C. *Gen. Man.*, H. E. Wilson .. P	1836	49/–	64/8	90/10	4,825,257
Norwich Union, Life, Norwich. *Gen. Man.* and *Act.*, J. J. W. Deuchar. London Office, 50, Fleet Street, E.C.	1808	45/8	59/6	85/3	8,823,303
Pearl, Life, London Bridge, City, E.C. *Jnt. Man'g Directors*, F. D. Bowles, Esq., J.P., C.C. G. Shrubsall, J.P. .. P	1864	49/–	65/–	92/–	4,093,684
Phœnix Assurance, 19 & 70, Lombard St., 57, Charing Cross. *Gen. Man.*, G. H. Ryan, F.I.A. .. .. .. P	1782	48/11	64/7	90/8	5,351,650
Provident Clerks & General Mutual Life Assurance Association, 27 & 29, Moorgate St., E.C. *Sec.*, John E. Gwyer M	1840	46/4	62/8	92/2	2,500,000
Prudential (Ordinary), Life, Holborn Bars. *Jnt. Secs.*, D. W. Stable and J. Smart. Further particulars see page 840 P	1848	49/6	65/11	91/11	39,595,493
Refuge, Life, Oxford St., Manchester. *Joint Mans.*, R. Wm. Green & Philip Smith. London Office, 133, Strand, W.C. P	1864	49/3	65/9	91/9	5,880,294
Royal Exchange Assurance, Fire, Life, Annuities, etc., Royal Exchange, and 44, Pall Mall. *Act.*, H. E. Nightingale, F.I.A. Further particulars see page xciii P	1720	49/–	64/9	90/2	3,668,557
Royal, Fire, Life, Annuities, and Accident, Royal Insurance Buildings, Liverpool. *Man.*, Chas. Alcock. London Offices, Lombard Street. *Sec.*, R. M'Connell P	1845	49/9	64/1	88/3	9,920,054
Sceptre, Life and Endowments, 40, Finsbury Pavement, E.C. *Sec.*, W. E. Wright P	1864	48/8	64/8	90/6	1,156,112
Scottish Amicable, Life, St. Vincent Place, Glasgow. *Man.*, W. Hutton. *Sec.*, C. Guthrie .. .. .. M	1826	51/9	66/3	90/1	5,198,215
Scottish Equitable, Life, 28, St. Andrew Square, Edinburgh.. *Man.* and *Act.*, G. M. Low. *Sec.*, J. J. McLauchlan. London Office, 19, King William St., E.C. *Sec.*, F. R. Leftwich .. .. M	1831	50/–	65/5	90/6	*5,500,000
Scottish Life, Life, Accident and Annuities, 19, St. Andrew Square, Edinburgh. *Man.*, David Paulin, F.R.S.E. London Office, 13, Clements Lane, E.C. *Sec.*, George Struthers .. .. .. P	1881	49/5	64/6	90/5	1,347,440
Scottish Metropolitan, Life, Accident and Annuities, 25, St. Andrew Square. Edinburgh. *Man.*, H. E. Marriott. London Office, 8, King Street, E.C. *Man.*, C. E. M. Hudson .. .. .. P	1876	40/8	54/7	79/7	723,579
Scottish Provident, Life & Annuities, 6, St. Andrew Square, Edinburgh. *Man.*, J. G. Watson. *Joint Secs.*, J. Lamb and R. T. Boothby. *Asst. Sec.*, C. W. Thomson. *Act.*, W. G. Walton. London Offices, 3, Lombard Street, E.C., and 17, Pall Mall, S.W. M	1837	42/4	56/6	83/2	14,186,000

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Title, Etc., of Office.	A	B	C	D	E
					£
Scottish Temperance, Life, Sickness & Accident, 105, St. Vincent Street, Glasgow. *Manager*, Adam K. Rodger. London, 2, 3 & 4, Cheapside. *Man.*, W. A. Bowie. *Less 10 per cent to Abstainers* .. P	1883	48/6	63/9	89/10	1,425,516
Scottish Union & National, Fire, Life, Accident, Pensions, Annuities, etc., 35, St. Andrew Sq., Edinburgh. *Gen. Man.*, J. A. Cook. London Office, 3, King William Street, E.C. *Sec.*, William G. Glennie P	1824	50/6	65/6	91/–	4,667,160
Scottish Widows' Fund, Life & Survivorship, 9, St. Andrew Square, Edinburgh. *Man. & Act.*, N. B. Gunn. *Sec.*, J. G. C. Cheyne. London Offices, 28, Cornhill, E.C., and 5, Waterloo Place, S.W. *Sec.*, R. Maclure M	1815	51/9	66/3	90/7	*18,899,983
Standard Life, 3, George Street, Edinburgh. *Man.*, Leonard W. Dickson. London Offices, 83, King William St., and 3, Pall Mall East. *Sec.*, J. H. W. Rolland P	1825	48/11	64/5	89/–	12,177,103
Star, Life, Annuities, Endowments, 32, Moorgate St., City. *Man.* and *Act.*, J. Douglas Watson .. .. .. P	1843	48/9	64/11	90/6	6,476,315
Sun, Life, 63, Threadneedle Street, E.C. *Act.*, R. G. Salmon, F.I.A. *Sec.* and *Gen. Man.*, E. Linnell .. .. P	1810	49/2	66/6	94/2	7,426,216
Sun Life of Canada, Life and Annuities, 93, Queen Victoria Street, E.C. *Man.*, J. F. Junkin .. .. P	1865	48/6	65/2	94/1	*6,000,000
United Kingdom Temp., etc., Life, 196, Strand, W.C. *Sec.*, H. W. Hasler M	1840	48/10	64/11	90/6	8,850,000
University, Life, 25, Pall Mall, S.W. *Act.* and *Sec.*, R. Todhunter, M.A. P	1825	49/11	65/4	91/5	887,164
Wesleyan and General, Life, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. *Gen. Man.*, R. A. Hunt, F.S.S., A.I.A. London Office, 101, Finsbury Pavement, E.C. **Further particulars see page 842.** M	1841	48/1	65/8	93/10	1,355,816
Yorkshire Limited, St. Helen's Square, York. London Office, 2, Bank Buildings, Princes Street. **Further particulars see page 834** P	1824	49/1	64/9	91/7	1,745,279

Medical Sickness and Accident, 33, Chancery Lane, W.C., *Sec.*, F. Addiscott, F.I.A., secure to registered members of the Medical Profession, and Licentiates of Dental Surgery in United Kingdom, a weekly allowance during incapacity from sickness or accident. Mutual. Established 1884. Assurance and Annuity Funds £220,000.

ESTABLISHED 1809.

North British and Mercantile

INSURANCE COMPANY.

with which is incorporated THE OCEAN MARINE INSURANCE CO.

Total Funds exceed *£19,000,000*

Annual Income exceeds *£4,000,000*

EVERY DESCRIPTION OF

LIFE ASSURANCE,

Endowment & Annuity Business.

Provision for Dependants.

Provision for Death Duties.

Provision for One's Own Later Years.

Participating Policyholders receive 90 per cent. of Life Assurance Surplus, which has yielded Large and Increasing Bonuses.

FIRE DEPARTMENT.

Property of nearly every description, at Home and Abroad, insured at the Lowest Rates. Losses by Lightning, Damage by Explosion of Gas in Buildings not forming part of any Gas Works, made good. Rents of Buildings insured.

Insurances against BURGLARY and ACCIDENTS to DOMESTIC SERVANTS, SHOP ASSISTANTS, etc., effected at moderate rates.

Head Offices:

LONDON: 61, Threadneedle St., E.C.

EDINBURGH: 64, Princes Street.

Branches, Agencies, and Medical Officers throughout the Kingdom.

AUSTRALIAN MUTUAL PROVIDENT SOCIETY.

Established 1849. Established 1849.

THE LARGEST MUTUAL LIFE OFFICE in the BRITISH EMPIRE and THE BEST BONUS-PAYING OFFICE in THE WORLD.

Funds - - - - £25,000,000
Annual Income - £3,000,000

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THE HON. HERBERT GIBBS (Messrs. Antony Gibbs & Sons)
THE HON. SIR JOHN A. COCKBURN, K.C.M.G., M.D.

Consulting Actuary: GEORGE KING, ESQ., F.I.A., F.F.A.
Chief Medical Officer: J. CHARLTON BRISCOE, ESQ., M.D.

BONUSES DIVIDED YEARLY. The CASH BONUSES divided among Policy-holders for the ONE YEAR, 1908, exceeded £740,000, producing Reversionary Additions of about £1,300,000.

H. W. APPERLY, Resident Secretary.

Chief Office for the United Kingdom:—
37, THREADNEEDLE STREET, LONDON, E.C.

PRUDENTIAL
ASSURANCE COMPANY, LTD.,
HOLBORN BARS, LONDON.

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THOMAS CHARLES DEWEY, ESQ., *Deputy-Chairman.*

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WILLIAM EDGAR HORNE, ESQ.
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SIR JOHN HENRY LUSCOMBE
WILLIAM THOMAS PUGH, ESQ.
J. WHATLEY SIMMONDS, ESQ.
THOMAS WHARRIE, ESQ.

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Assistant Managers:

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FREDERICK SCHOOLING, ESQ., *Joint Manager and Actuary.*

Every description of Life Assurance and Annuity Business Transacted.

INVESTED FUNDS - £75,000,000.

The Last Annual and Valuation Reports can be had on application.

Clergy Mutual Assurance Society.

FOUNDED 1829.

Office—2 & 3, THE SANCTUARY, WESTMINSTER, S.W.

Patrons—THE ARCHBISHOP OF CANTERBURY, THE ARCHBISHOP OF YORK.
President—THE BISHOP OF LONDON. *Vice-President*—THE LORD HARRIS.
Chairman—THE DEAN OF CANTERBURY.
Deputy-Chairman—SIR PAGET BOWMAN, BART.
Secretary—W. N. NEALE, ESQ.
Actuary and Manager—FRANK B. WYATT, ESQ., F.I.A.

This Society, which has completed **EIGHTY YEARS** of successful development, grants Life Assurances on highly favourable terms to

The CLERGY, their LAY RELATIVES & CONNECTIONS

ALL PROFITS BELONG TO THE MEMBERS.

Funds:		Bonuses Divided:
£4,439,825	✵	**£4,256,464**

LOW PREMIUMS.
LARGE BONUSES.

Notwithstanding the LOWNESS of the Premiums charged, the BONUSES are on an EXCEPTIONALLY HIGH SCALE.

BONUS YEAR, 1911.

All With-Profit Assurances in force on 1st June in that year will share in the Distribution.

Prospectus, and Leaflets descriptive of special classes of Assurance, will be sent on application.

Assurances WITHOUT PROFITS, at low rates of premium, may be effected by any person irrespective of any special qualification by relationship to the Clergy.

ANNUAL PREMIUMS for £1,000, with PROFITS

Age next Birthday.	£1,000 Payable at Death.			£1,000 Payable at Age 60 or earlier Death.		
	£	s.	d.	£	s.	d.
25	20	1	8	27	3	4
30	23	3	4	32	10	10
35	26	10	0	40	1	8
40	31	1	8	51	5	0

Note.—Under the Reduced Premium System (explained in Prospectus) four-fifths only of these premiums need be paid, the other one-fifth remaining a charge to be repaid out of bonus.

NO AGENTS are employed and **NO COMMISSION** is paid for the introduction of business, and thus large sums are saved for the benefit of Members.

Assurances can be effected by **direct communication** with the Office, 2 & 3, THE SANCTUARY, WESTMINSTER, S.W.

General Life Assurance Co.

ESTABLISHED 1837.

CAPITAL AND RESERVES, £3,000,000.

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Deputy Chairman—LORD ARTHUR CECIL.

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Right Hon. Viscount VALENTIA, C.B., M.V.O., M.P.

MEDICAL OFFICERS:

P. H. PYE-SMITH, Esq., M.D., F.R.S., 48, Brook Street, W.
FREDERICK TAYLOR, Esq., M.D., 20, Wimpole Street, W.
JOHN FAWCETT, Esq., M.D., 66, Wimpole Street, W.

Advances made on Reversions, Life Interests, and on Personal Security in connection with a Life Policy. Six per cent permanent reduction to Medical Men upon With Profit tables.

103, Cannon Street, London, E.C. **JOHN ROBERT FREEMAN,** *Manager & Secretary.*

Wesleyan & General Assurance Society

EMPOWERED BY SPECIAL ACT OF PARLIAMENT.

ESTABLISHED 1841.

Chief Offices:

ASSURANCE BUILDINGS, STEELHOUSE LANE, BIRMINGHAM.

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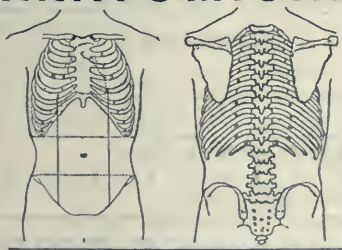

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Telegrams: "Firstaid, London." Telephone: 861 Holborn.

St. MARY'S HOSPITAL MEDICAL SCHOOL

(UNIVERSITY OF LONDON).

SESSIONS 1910.

Students may conveniently commence work on any of the following dates:—

Thurs., JAN. 6th, 1910; Thurs., APRIL 21st, 1910; Sat., OCT. 1st, 1910.

THE MEDICAL SCHOOL is situated in the Paddington District of the West End of London, and being in close proximity to five Railway Stations, is easy of access from all parts of the Metropolis and Suburbs. An official register of Students' rooms in the neighbourhood, and of private families who receive students as boarders, is kept in the office of the Medical School.

The Athletic Clubs' Ground (8 acres) is situated at North Kensington, and is easy of access from the Hospital. A new Ground has recently been acquired at Park Royal, Acton, and will be ready for use in the summer of 1910.

COURSES OF STUDY.

Instruction is provided in all subjects of the curriculum, under Recognised Teachers of the University of London, as follows:—

(*a*) **Preliminary Scientific.**—Complete Courses in Chemistry, Physics, and Biology. Students can join in January, April, or October.

(*b*) **Intermediate.**—Systematic Courses of Anatomy, Physiology, and Pharmacology, with Special Tutorial Classes for the 2nd M.B. London and Primary F.R.C.S.

(*c*) **Final.**—Systematic Lectures, Clinical Instruction, and Tutorial Classes in Medicine, Surgery, Obstetrics, and the various Special Departments. Full Laboratory Courses in General and Special Pathology; also in Bacteriology and Chemical Pathology with especial Reference to their clinical application.

CLINICAL PATHOLOGY AND OPSONIN DEPARTMENT.

Advanced Courses of Clinical Pathology and Bacteriology, under the direction of Sir Almroth Wright, F.R.S., are held throughout the year, and practical experience in Opsonic Investigations may be obtained in the Department of Therapeutic Inoculation.

RESIDENT MEDICAL OFFICERS.

Eighteen are appointed Annually by Competitive Examination.

Six Entrance Scholarships in Natural Science, value from £145 to £25, are awarded annually by Examination in September.

Three General Proficiency Scholarships (£20 each) and upwards of thirty other Scholarships and Prizes are offered for competition among the Students of the School each year.

HOSPITAL STAFF.

Consulting Physicians—Dr. CHEADLE, Dr. LEES.
Consulting Surgeons—Mr. A. T. NORTON, C.B., Mr. EDMUND OWEN, Mr. H. W. PAGE, Mr. A. J. PEPPER; (Aural) Mr. G. P. FIELD; (Ophthalmic) Sir G. A. CRITCHETT; (Skin) Sir MALCOLM MORRIS; (Dental) Mr. MORTON SMALE; (Throat) Dr. SCANES SPICER. Consulting Anæsthetist: Mr. HENRY DAVIS.
Physicians—Dr. S. PHILLIPS, Dr. A. P. LUFF, Dr. H. A. CALEY, Dr. WILFRED HARRIS (supernumerary), (Out-patients) Sir JOHN BROADBENT, Dr. W. H. WILLCOX
Surgeons—Mr. J. E. LANE, Mr. H. S. COLLIER, Mr. V. W. LOW; (Out-patients) Mr. W. H. CLAYTON-GREENE, Mr. MAYNARD SMITH, Mr. FITZWILLIAMS.
Physicians-Accoucheur—Dr. M. HANDFIELD-JONES; (Out-patients) Dr. W. J. GOW
Ophthalmic Surgeon—Mr. H. E. JULER *Assistant Ophthalmic Surgeon*—Mr. LESLIE PATON
Surgeons to Ear, Nose and Throat Department—Dr. WM. HILL. Mr. C. I. GRAHAM
Physician in charge of Skin Department—Dr. GRAHAM LITTLE
Dental Surgeon—Mr. W. H. DOLAMORE
Director of Inoculation Department—Sir ALMROTH WRIGHT, F.R.S.

LECTURERS.

Clinical Medicine—Dr. PHILLIPS.
Clinical Surgery—Mr. LANE.
Medicine—Dr. LUFF, Dr. CALEY, Dr. HARRIS, Sir JOHN BROADBENT
Surgery—Mr. LANE, Mr. COLLIER.
Practical Surgery—Mr. LOW. Mr. MAYNARD SMITH.
Pathology—Sir ALMROTH WRIGHT, F.R.S., Dr. SPILSBURY.
Bacteriology—Sir ALMROTH WRIGHT, F.R.S. Capt. DOUGLAS, I.M.S. (Assist. Lecturer).
Pathological Chemistry—Dr. W. H. WILLCOX.
Midwifery—Dr. M. HANDFIELD-JONES.
Pharmacology—Dr. R. H. MILLER.
Forensic Medicine—Dr. WILLCOX.
Hygiene—Dr. WILLCOX
Mental Diseases—Dr. HYSLOP.
Neurology—Dr. HARRIS.
Anatomy—Mr. W. H. CLAYTON-GREENE.
Physiology and Histology—Dr. N. H. ALCOCK.
Biology—Dr. RIDEWOOD.
Chemistry—Dr. G. SENTER.
Physics—Mr. W. H. WHITE.

For Calendar of the Medical School, giving full information as to Courses of Study, Fees, etc., apply to the Dean, Mr. CLAYTON-GREENE, or to Mr. B. E. MATTHEWS, School Sec.

TO MEDICAL MEN.

SCHOLARSHIPS of £150 are again offered to fully-qualified Medical Men (or Women) desirous of studying Homœopathy in the Schools of America.

For full particulars apply—

"Scholarship Committee," London Homœopathic Hospital,
GREAT ORMOND STREET, LONDON, W.C.

THE ROYAL DENTAL HOSPITAL
OF LONDON,
LEICESTER SQUARE, LONDON, W.C.

THE NEW HOSPITAL was opened in 1901. The School is thoroughly equipped for teaching purposes including a TEACHING MUSEUM and a LIBRARY; METALLURGICAL and HISTOLOGICAL LABORATORIES; Departments for BACTERIOLOGY and RADIOGRAPHY. The CLINIC of the Hospital is *unrivalled*, the work being carried on in rooms exceptionally spacious and well fitted.

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The ENTRANCE SCHOLARSHIP in Mechanical Dentistry of £25. Open only to Pupils of Private Practitioners.
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The STORER-BENNETT SCHOLARSHIP of £50.
The ALFRED WOODHOUSE SCHOLARSHIP of £35.
The ROBERT WOODHOUSE SCHOLARSHIP of £10.
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FIVE HOUSE SURGEONS appointed every six months.

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The Laboratories occupy an entire floor of the building, and are well fitted. Pupils can *join at any time* for the two years' training in Mechanical Dentistry specified in the Curriculum, or *Pupils of Private Practitioners for a shorter period.*

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Open only to those joining for the two years' Mechanical and subsequent two years' Hospital training.
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An ENTRANCE SCHOLARSHIP of £25 }
A SCHOLARSHIP of £25. Awarded after two years' mechanical training. Metallurgy and Mechanical Dentistry.

For further particulars apply— THE DEAN.

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MEDICAL COLLEGE.
(UNIVERSITY OF LONDON.)

THIS COLLEGE IS COMPLETE IN ALL DEPARTMENTS,

Special Teachers for all Preliminary and Intermediate Subjects.

Eight Entrance Scholarships are awarded annually of the aggregate value of **£430.**

Twenty-two Hospital and Teaching **Appointments** are made yearly.

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President: THE RIGHT HON. THE EARL OF BUCHAN.
Treasurer: VINCENT R. HOARE, Esq. *Bankers:* Messrs. HOARE, 37, Fleet Street.

HONORARY MEDICAL STAFF.

Consulting Physician—Sir Francis Henry Laking, Bart., K.C.V.O., M.D., 62, Pall Mall, S.W. *Consulting Surgeons*—F. Bowreman Jessett, Esq., F.R.C.S., 23, Brook Street, Grosvenor Square, W.; Edgar Hughes, Esq., F.R.C.S., 11, Shelley Court, Tite Street, Chelsea, S.W.; Charles Ryall, Esq., F.R.C.S., 62, Harley Street, W. *Surgeons*—C. J. Ogle, Esq., M.R.C.S., 1, Cavendish Place, W.; C. H. Leaf, Esq., F.R.C.S., 75, Wimpole Street, W.; W. E. Miles, Esq., F.R.C.S., 17, Devonshire Place, W.; F. L. Daniel, Esq., F.R.C.S., 152, Harley Street, W. *Surgeon to Out-Patients*—P. Maynard Heath, Esq., M.S., F.R.C.S., 5, Devonshire Street, W. *Anæsthetists*—C. N. Barton, Esq., F.R.C.S., L.R.C.P., 17, Redcliffe Gardens, S.W.; W. T. Mullings, Esq., M.D., 84, Belgrave Road, S.W.; F. J. Lawson, Esq., M.R.C.S., L.R.C.P., 66, Belgrave Road, S.W. *Matron*—Miss Mackintosh. *Secretary*—Percy H. Sheffield.

Operations take place on Mondays at 2.30 p.m., on Tuesdays at 2 p.m., and on Wednesdays at 3.30 p.m. The Practice is free to Medical Men and Students. Out-Patients seen daily at 2 o'clock; also on Tuesday evenings at 8 o'clock. All treatment is free, but In-Patients pay according to their means for maintenance.

HONYMAN-GILLESPIE LECTURESHIPS IN MEDICINE

—— SECOND YEAR 1909-1910. ——

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COURSE 1.—Homœopathic Materia Medica, by CHAS. E. WHEELER, M.D., B.S., B.Sc. (Lond.), Assistant Physician London Homœopathic Hospital, at CHALMERS HOUSE, 43, RUSSELL SQUARE, W.C. Mondays and Thursdays, at 5.0 p.m. **October 18th to December 16th, 1909. January 24th to March 24th, 1910.**

COURSE 2.—Homœopathic Therapeutics (with Clinical Demonstrations). By JAS. SEARSON, M.D. (Brux.), Assistant Physician London Homœopathic Hospital; sometime British Homœopathic Association Travelling Scholar, U.S.A., at the LONDON HOMŒOPATHIC HOSPITAL, GREAT ORMOND STREET, BLOOMSBURY, W.C. Tuesdays and Fridays at 5.0 p.m. **October 19th to December 14th, 1909. January 25th to March 25th, 1910.**

A Second Series of SIX PROFESSIONAL SCHOLARSHIPS

in the Homœopathic Practice of Medicine is offered. The Scholarships are of the value of **£50** each, and are available for Qualified Medical Men and Women intending to settle in Great Britain.

For further particulars apply to the Dean—

J. ROBERSON DAY, M.D. (Lond.),
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RICHMOND, WHITWORTH and HARDWICKE HOSPITALS, . . .

DUBLIN.

THE SESSION 1909-10 commenced on Friday, October 1st, 1909. These Hospitals for Surgical, Medical and Fever cases respectively, contain nearly 300 beds.

Physicians: Doctors O'Carroll, Coleman, and Travers-Smith. **Assistant Physicians:** Doctors Matson, Purser, and Nesbitt.

Surgeons: Sir Thornley Stoker, Sir Thomas Myles, and Mr. R. J. Harvey. **Assistant Surgeons:** Mr. Pryce Peacock and Mr. R. V. Slattery.

Ophthalmic Surgeon; Mr. Joyce. **Gynæcologist:** Dr. Wilson.

Laryngologist: Mr. Gogarty. **Pathologist:** Dr. Earl.

Unqualified resident clinical clerks are appointed quarterly from any recognised school of medicine.

For Particulars apply to—
R. TRAVERS SMITH, M.D., 20, Lower Fitzwilliam Street, Dublin, *Hon. Sec. and Treasurer.*

Royal Westminster Ophthalmic Hospital,

CHARING CROSS, W.C.

The Practice of the Hospital is open to Registered Medical Practitioners and Students, who may enter at any time. Clinical Work begins daily at 1.15.; Operations at 3 p.m. Practical Instruction is given throughout the year in the Diagnosis and Treatment of Errors of Refraction and Diseases of the Eye. Courses of Lectures and Demonstrations in the various branches of Ophthalmology are given thrice yearly, commencing in January, May, and October. Fees, inclusive of one Course of Lectures and Demonstrations, six months, £3 3s. Perpetual £5 5s.

For further particulars apply to—W. H. McMULLEN, F.R.C.S., Hon. Sec., Medical Committee.

POST-GRADUATE COLLEGE,

(WEST LONDON HOSPITAL,)

HAMMERSMITH ROAD, W.

THE HOSPITAL contains 160 beds, all of which are in daily occupation. Over 2300 In-Patients were treated in the Hospital during last year; while the attendances of Out-Patients were 135,959.

The Physicians and Surgeons attend daily at 2.30 p.m. Instruction is given by the Assistant Physicians and Surgeons in the O.P. Department daily at 2.15 p.m.; and there are Special Departments for the Diseases of the Eye, Ear, Throat and Nose, Women, Orthopædic Surgery and Children. Post-Graduate Lectures are delivered daily, except Saturdays, at 5 o'clock, in the Lecture Room. Special Classes are frequently held in different subjects.

No Students are admitted to the Practice of the Hospital. A Special Building containing **Lecture Room, a Reading and Writing Room, &c.,** is provided for the use of Post-Graduates.

A fully-equipped **Clinical Investigation Laboratory and an X-Ray Department** have been established at the Hospital. A Special Class in Bacteriology is held about the beginning of each month by the Pathologist. A Certificate signed by the Staff is awarded after Three Months' Hospital Attendance.

The Fee for the Hospital Practice, including the Post-Graduate Lectures, is **£3 3s.** for One Month; **£6 6s.** for Three Months; **£10 10s.** for Six Months; and **£15 15s.** for One Year.

Full particulars can be obtained from the undersigned at the Hospital.

L. A. BIDWELL, Dean; DONALD ARMOUR, Vice-Dean.

UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE.

CURRICULUM.—Complete Courses of instruction are offered to Students (Men and Women) preparing for Degrees in Medicine and Surgery, and in Science, for Degrees and Diplomas in Dentistry, for the qualifications of the Conjoint Board and other Licensing Bodies, and for Public Health and Pharmaceutical Diplomas.

The University contains spacious and well-equipped Laboratories in all departments of Science and Medicine. For Women Students a separate Laboratory for Practical Anatomy and Special Common Rooms are provided.

The Prospectus of the Medical Faculty and the special Prospectuses for the following departments: Dental, Public Health, and Pharmaceutical, will be forwarded on application to the REGISTRAR.

THE UNIVERSITY OF LIVERPOOL.

FACULTY OF MEDICINE.

Complete Courses are provided for Degrees in Medicine, Surgery and Dental Surgery, and for Diplomas in Dental Surgery, Public Health, Tropical Medicine, Veterinary Hygiene, and Pharmacy.

Prospectuses regarding the various courses, containing full information as to the Conditions, Fees, Scholarships, Fellowships, etc., may be obtained on application to the REGISTRAR.

K. W. MONSARRAT, M.B., F.R.C.S., Dean.

Royal College of Surgeons of Edinburgh

FOUNDED 1505.

Copies of the Regulations for the Fellowship, Licence, and Licence in Dental Surgery, with dates of Examinations, Curricula, etc., for the year 1909-10, are now ready, and may be had on application to—

D. L. EADIE, 54, GEORGE SQUARE, EDINBURGH, *Clerk to the College.*

LIP-READING.

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Managing Director - Mr. G. B. STOCKER.

Mr. STOCKER is one of the authors of "*Medical Partnerships, Transfers and Assistantships*," which describes fully the conditions usual in Medical Deeds (Partnerships, Transfers, etc.).

Telegraphic Address: "TRIFORM, LONDON." **Telephone: No. 1854 Gerrard.**

UNIVERSITY COLLEGE OF SOUTH WALES and MONMOUTHSHIRE, CARDIFF.

(A Constituent College of the University of Wales.)

FACULTY OF MEDICINE.

Students may spend three out of the five years of their medical study at this College. The courses of instruction given are recognised as qualifying for the Examinations of the Universities, Royal Colleges, and other licensing bodies of Great Britain and Ireland. Medical men preparing for a Diploma in Public Health and Hygiene can attend complete courses of instruction in these subjects. All classes are open to Women Students. The composition fee for students preparing for the Preliminary Scientific and Intermediate examination in Medicine of the University of London is £57 10s. The composition fee for the classes qualifying for the first and second examinations of the Conjoint Board is £41 10s. The composition fee for the D.P.H. Course is £21. Hospital instruction may be taken at the Cardiff Infirmary, which is situated within five minutes' walk of the College. A course of Lectures to Midwives adapted to the requirements of the Central Midwives Board, under the Midwives Act, was commenced in October, 1904. The Lectures are suitable both for Pupil-Midwives and Practising-Midwives as well as for Nurses who desire to enter for the Examination for Certification under the Act. A prospectus containing all information regarding classes, fees and entrance scholarships may be obtained by application to the Registrar of the College.

Physics—Prof. A. L. Selby, M.A., assisted by J. H. Shaxby, B.Sc., A.R.C.S., and D. E. Thomas, B.A., B.Sc.
Chemistry—Prof. C. M. Thompson, M.A., D.Sc., F.C.S., assisted by Assist.-Prof. E. P. Perman, D.Sc., and Robert D. Abell, D.Sc., F.I.C.
Zoology—Prof. W. N. Parker, Ph.D., F.Z.S., assisted by T. H. Burlend, M.A., B.Sc.
Botany—Prof. A. H. Trow, D.Sc., F.L.S., assisted by M. Y. Orr
Anatomy—Prof. David Hepburn, M.D., C.M., F.R.S.Ed., assisted by D. Leighton Davies, M.D., M.S.(Lond.)
Physiology—Prof. John Berry Haycraft, M.D., D.Sc., F.R.S.E., assisted by R. L. Mackenzie Wallis, B.A.
Pharmacology and Therapeutics—W. Mitchell Stevens, M.D., M.R.C.P.
Bacteriology—H. A. Schölberg, M.B., D.P.H.
Public Health and Hygiene—Edward Walford, M.D., D.P.H., and William Williams, M.A., M.D., D.P.H.
Hygienic Chemistry—J. H. Sugden, M.Sc., F.I.C.
Midwifery (for Midwives)—E. J. Maclean, M.D., M.R.C.P. F.R.S.E.

J. AUSTIN JENKINS, B.A., Registrar of the College.
DAVID HEPBURN, M.D., C.M., F.R.S.E., Dean of the Faculty of Medicine.

University of Bristol

FACULTY OF MEDICINE

(Medical, Dental, and Public
— Health Departments.) —

THE COURSES given at the University, and at the allied Hospitals which contain over 600 beds, provide full instruction for the Degree and Diploma Examinations in Medicine and Dentistry, and for the Diplomas in Public Health.

There is a Hall of Residence for Women Students.

The Medical Entrance Scholarship is of the value of £75.

Full information as to Courses of Study, Fees, &c., may be obtained on application ——— to THE REGISTRAR. ———

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE, NEWCASTLE-ON-TYNE.

DEGREES IN MEDICINE, SURGERY, AND HYGIENE.—Six Degrees and two Diplomas are conferred by the University of Durham—*viz.*, the Degrees of Bachelor of Medicine, Doctor of Medicine, Bachelor of Surgery, and Master of Surgery; Bachelor in Hygiene, and Doctor in Hygiene; and the Diplomas in Public Health and Dental Surgery. These Degrees are open to Men and Women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who have attained the age of forty years, who can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degree of M.B. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, or its equivalent, may enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in *three* of the subjects of the Matriculation Examination (exclusive of Religious Instruction and Elementary Mathematics), provided that one of them is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degree.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diploma in Public Health; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided, and a Diploma in Dental Surgery may be obtained after Examination.

All information, together with Examination Papers, etc., is given in the Calendar of the University of Durham College of Medicine, Newcastle-upon-Tyne, which may be obtained gratis from the Secretary at the College.

Scholarships, &c.—University of Durham Scholarship, value £100 for proficiency in Arts, awarded annually to full students in their first year only. The Pears Scholarship—value £150—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Physiology, and Chemistry. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500—for Pathology. Luke Armstrong Scholarship—interest on £680—for Comparative Pathology. Stephen Scott Scholarship—interest on £1000—for promoting the study of Surgery and allied subjects. Heath Scholarship—the late George Yeoman Heath, M.D., M.B., D.C.L., F.R.C.S., President of the University of Durham College of Medicine, bequeathed the sum of £4000 to found a Scholarship in Surgery, the interest to be awarded every second year. Gibson Prize—value the interest of £225—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks, and Dressers are appointed every three months.

The Royal Victoria Infirmary contains over 400 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given as opportunity offers, by the Pathologist; Practical Midwifery can be studied at the Newcastle Maternity Hospital, where there is an Out-door Practice of about 1000 cases annually.

FEES.

(*a*) A composition Ticket for Lectures at the College may be obtained—
I.—By payment of 72 guineas on entrance.
II.—By payment of 46 guineas at the commencement of the First Year, and 36 guineas at the commencement of the Second Year.
III.—By three annual instalments of 36, 31, and 20 guineas respectively, at the commencement of the Sessional year.

(*b*) Fees for attendance on Hospital Practice:—
For 3 months' Medical and Surgical Practice, £5 5s. For 6 months', £8 8s. For 1 year's, £12 12s. For Perpetual, £26 5s
Or by three instalments at the commencement of the Sessional year, *viz.*, First year, 12 guineas; Second year, 10 guineas; Third year, 6 guineas. Or by two instalments —First year, 14 guineas; Second year, 12 guineas.
In addition to the above fees, the Committee of the Royal Victoria Infirmary require the payment of 2 guineas yearly up to three years from every Student attending the Infirmary for a year or part of a year. After three years of attendance, such payment will be no longer necessary.

(*c*) Single courses of Lectures, 5 guineas.

(*d*) A Composition Ticket for the courses of Lectures and Practical work of the first two years of the curriculum, may be obtained by the payment of 40 guineas on entrance.

(*e*) Composition fee for Lectures, etc., at College for Diploma in Dental Surgery, 34 guineas; Composition fee for Practical work at Dental Hospital, 35 guineas.

Fees for Lectures, etc., at the College must be paid to the Secretary. Fees for Hospital Practice to Dr. W. E. HUME, and fees for Practical Dental Work to the Dean of the Dental Hospital—at the time of entry.

Further particulars may be obtained from the Sec., PROF. HOWDEN, at the College.

UNIVERSITY OF EDINBURGH.

SESSION 1909—1910.

Principal—SIR WILLIAM TURNER, K.C.B., D.C.L., LL.D., M.B., ETC.

The WINTER SESSION opens on 1st October, and closes on 19th March; the SUMMER SESSION opens on 1st May, and closes about the middle of July.

FACULTY OF MEDICINE.

Dean—PROFESSOR HARVEY LITTLEJOHN, M.A., M.B., B.Sc.

The Faculty embraces fourteen Chairs and sixteen Lectureships; and attached to these Chairs are about thirty Assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz.:—

PROFESSORS.

Chemistry—James Walker, D.Sc.
Zoology—J. Cossar Ewart, M.D.
Botany—Isaac Bayley Balfour, M.D., D.Sc.
Physics—J. G. MacGregor, D.Sc., LL.D.
Anatomy—Arthur Robinson, M.D.
Physiology—E. A. Schäfer, LL.D.
Materia Medica—Sir Thomas R. Fraser, M.D., LL.D.
Pathology—William S. Greenfield, M.D.
Forensic Medicine—Harvey Littlejohn, M.B., B.Sc.
Public Health—C. Hunter Stewart, M.B., D.Sc.
Medicine—John Wyllie, M.D., LL.D.
Surgery—Alexis Thomson, M.D., C.M.
Midwifery—Sir J. Halliday Croom, M.D.
Clinical Surgery—Francis M. Caird, M.B., F.R.C.S.
Clinical Medicine—Sir Thomas R. Fraser, M.D., Wm. S. Greenfield, M.D., John Wyllie, M.D

UNIVERSITY LECTURERS.

Mental Diseases—T. S. Clouston, M.D.; George M. Robertson, M.B.
Diseases of the Eye—George Mackay, M.D.
Gynæcology—A. H. F. Barbour, M.D.
Clinical Instruction on Diseases of Children—G. H. Melville Dunlop, M.D., and Staff of Royal Hospital for Sick Children
Embryology and Vertebrate Zoology—J. Beard, D.Sc.
Anatomy—D. Waterston, M.D.
Applied Anatomy—Harold J. Stiles, M.B., C.M.
Physiological Chemistry—W. Cramer, Ph.D., D.Sc.
Experimental Physiology—W. T. A. Jolly, M.B.
Experimental Pharmacology—W. C. Sillar, M.D., B.Sc.
Histology—Harold Pringle, M.D.
Pathological Bacteriology—W. E. Carnegie Dickson, M.D., B.Sc.
Physics—C. G. Knott, M.A., D.Sc.
Diseases of the Larynx, Ear, and Nose—A. Logan Turner, M.D.
Tropical Diseases—Major D. G. Marshall, I.M.S.
Medical Entomology and Protozoology—J. H. Ashworth, D.Sc.
Tropical Hygiene—J. B. Young, M.B., D.Sc. (conjointly with Professor)
Diseases of the Skin—Norman Walker, M.D.
Clinical Instruction in Infectious Fevers—Alexander James, M.D., and Claude B. Ker, M.D.
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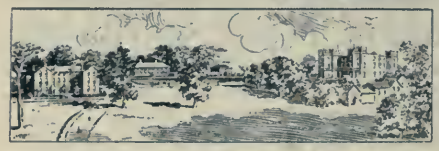

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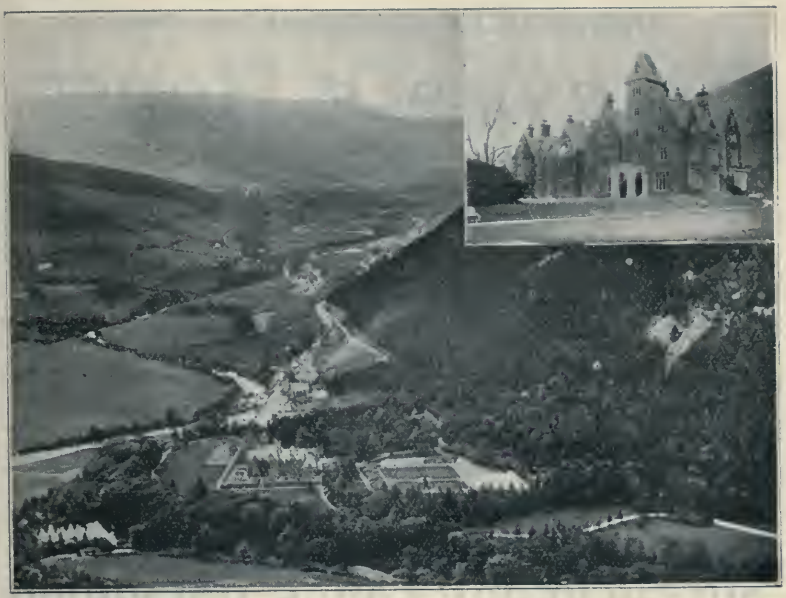

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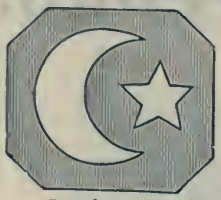

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A Branch House connected with The Retreat, York, situated near the Raincliffe Woods, about two miles from Scarborough, for the reception of **Convalescent Patients,** also for the treatment of persons suffering from **Incipient or Mild Forms of Mental Disorder** who cannot be certified as of unsound mind, and who wish voluntarily to place themselves under skilled treatment. —For further particulars apply to the Matron, or to DR. BEDFORD PIERCE, at THE RETREAT, YORK. *Nat. Telephone:* **282 Scarborough.**

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Ladies can be received either as voluntary patients or certified under the Lunacy Act, 1890.

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Chairman—**The Rt. Hon. The Earl of Mansfield.**

THIS Asylum, for Private Patients only, is beautifully situated in the immediate vicinity of Perth, in the midst of extensive Pleasure Grounds, which are surrounded by the fields of the Home Farm.

The Main Building has been entirely re-organized and enlarged by the addition of *two wings*, for the reception of acute cases, so as to render it an efficient *Hospital* as well as a comfortable *Home*.

The Mansion-House of PITCULLEN, SEVEN GABLES, Elie, and THE EAST AND WEST VILLAS, afford the necessary variety of accommodation for modern treatment. Consumptive Patients are separately treated in Sanatoria.

National Telephone Company: No. 104, Perth.

Postal and Telegraphic Address: Dr. Urquhart, Perth.

HOLLOWAY SANATORIUM,
VIRGINIA WATER.

A Registered Hospital for the CURE and CARE of the INSANE and of NERVOUS INVALIDS of the MIDDLE and UPPER CLASSES.

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted. There is a branch establishment at Brighton, where Patients and Boarders can be sent for a change, and provided with all the comforts of a well-appointed home.

For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.

WESTERMAINS PRIVATE ASYLUM,
KIRKINTILLOCH,
NEAR GLASGOW.
FOR LADIES.

Terms:—EIGHTY GUINEAS AND UPWARDS.

Apply—Mr. LAWRIE, Resident Proprietor.

QUIET CASES ONLY RECEIVED.

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NEAR EXETER.

A REGISTERED HOSPITAL for the UPPER and MIDDLE CLASSES.

This Institution is situated in a beautiful and healthy locality, within a short distance of the City of Exeter. There is comfortable accommodation at moderate rates, both in the Hospital itself and at Plantation House, Dawlish, a seaside residence on the South Devon Coast, affording more privacy, with the benefits of sea-air and a mild and salubrious climate. Private rooms and Special Attendants provided, if required. Voluntary Patients or "Boarders," not under certificates, also received.

FOR TERMS, ETC., APPLY TO—

W. B. MORTON, M.B.Lond., *Resident Medical Superintendent.*

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BARNWOOD HOUSE,
GLOUCESTER.

A REGISTERED HOSPITAL for PRIVATE PATIENTS
Only, of the UPPER and MIDDLE CLASSES.

ARRANGED and furnished with all the most approved appliances for the treatment, comfort, and amusement of the Inmates. Within two miles of the Railway Station, and easily accessible by Rail from London and all parts of the kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of 250 acres. *For terms, etc., apply to—*

JAS. GREIG SOUTAR, M.B., C.M., *Resident Superintendent.*

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PLYMPTON, SOUTH DEVON
ESTABLISHED 1834.

PLYMPTON HOUSE is licensed for the accommodation of both sexes, and is well adapted by its position and appointments for the medical treatment and care of Patients of the Upper and Middle Classes, suffering from MENTAL DISEASE.

The proprietor, Dr. ALFRED TURNER, has had very large experience of Mental cases, both in public and private institutions, and everything that can be done to ameliorate the condition of the chronic, and promote the cure of the acute cases—placed under his charge—is guaranteed.

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Telephone No. **2** PLYMPTON. DR. TURNER, PLYMPTON.

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33, PECKHAM ROAD, LONDON, S.E.

Telephone: No. HOP. **1037.** Telegrams: "PSYCHOLIA, LONDON."

For the Care and Treatment of those of Both Sexes suffering from NERVOUS and MENTAL DISORDERS.

CONSISTS of separate Houses, lit by electricity and completely modernised, standing in 20 acres of picturesque grounds, including cricket and football field, tennis court, and croquet lawns. The Terrace Houses are quite separate from the rest of the Institution, and are specially adapted for the reception of Mild and Borderland Cases, who can enter voluntarily.

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For further particulars apply to the MEDICAL SUPERINTENDENT at the above address.

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BETHLEM ROYAL HOSPITAL

ARE PREPARED TO RECEIVE A LIMITED NUMBER OF PATIENTS AT TWO GUINEAS A WEEK, INCLUSIVE.

All particulars may be obtained from the Resident Physician, or the Steward of the Hospital.

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Telegrams: "ENVOY, LONDON" Telephone: 5608 Central.

St. Luke's Hospital
For Mental Diseases,
OLD STREET, LONDON.

ESTABLISHED 1751.

For the TREATMENT OF MENTAL DISEASES. Admission on payment of 15/- to 30/- per week, or gratuitously.

CONVALESCENT ESTABLISHMENT at ST. LAWRENCE ON SEA, near RAMSGATE. Voluntary Boarders (Ladies) are received at the Home.

TRAINED NURSES supplied from the Private Nursing Staff for nursing mental and nervous cases at their own Home.

Enquiries should be addressed to the Secretary at the Hospital.

W. H. BAIRD, *Secretary.*

PECKHAM HOUSE,
PECKHAM, S.E.

Telegrams: "Alleviated, London." Telephone 1576 Hop.

Extensive arrangements are made in this Asylum for the reception of PRIVATE PATIENTS of BOTH SEXES. *Terms from* **25/-** *per week.*

Further particulars can be obtained upon application to the RESIDENT PHYSICIAN.

Epilepsy and Mental Deficiency.
NEW LODGE, BILLERICAY, ESSEX.

FOR GENTLEMEN. Grounds cover eight acres.

CERTIFICATED NURSES.

Inclusive Terms from **16s.** to **2** guineas weekly.

Conducted by - - THE CO-OPERATIVE SANATORIA, LTD.

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A Private Home for the Care and Treatment of Ladies Mentally Afflicted.

Formerly at Earl's Court and Peterborough House, Fulham, under Dr. R. Gardiner Hill.

A Modern Mansion, specially adapted with annexe, on an elevated site, surrounded by 12½ acres of Gardens, etc., and within five minutes' walk of Tulse Hill Station (L. B. & S. C. R.); other Stations—Herne hill (L. C. & D. R.) and Streatham Hill.

For Terms, etc., apply to—

T. DUNCAN GREENLEES, M.D., F.R.S. Edin., *Res. Phys. & Supt.*

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WINTERBOURNE, near BRISTOL.

A Sanatorium for Ladies and Gentlemen suffering from Nervous and Mental Disorders.

Situated in a large Park, 300 feet above sea level, in a healthy and picturesque locality, easily accessible from London, Bristol, and Cardiff by Winterbourne Station; or from Fishponds, Yate, or Patchway Stations.

Voluntary Boarders received without Certificates.

For further information, see London Medical Directory, p. 2031, and for Terms, etc., apply to Dr. EAGER, or Dr. J. D. THOMAS, Resident Medical Proprietors, Northwoods House.

Dr. EAGER *or* Dr. THOMAS *attends at* 64, *PARK STREET, BRISTOL, on Mondays and Thursdays, from* 12 *to* 3 *o'clock.*

TELEPHONE NO. 18 WINTERBOURNE.

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49, North End Road, West Kensington, W.

Telephone No. 1004 Hammersmith.

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Apply to Mrs. CHAPMAN (Resident Lady Superintendent), or to A. H. SUTHERLAND, Esq. (Licensed Propr.), 2a Marloes Road, Kensington, W.

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Telephone No. 524 Streatham.

Tooting Bec Road, Tooting, S.W.

A HOME FOR THE CARE AND TREATMENT OF GENTLEMEN MENTALLY AFFLICTED.

Apply to H. J. HIND, Esq., M.R.C.S. (Res. Medical Superintendent), or to A. H. SUTHERLAND, Esq. (Licensed Propr.), 2a, Marloes Road, Kensington, W.

THE WARNEFORD,

HEADINGTON HILL, OXFORD.

A Registered Hospital for the Care and Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders.

President—THE RIGHT HON. THE EARL OF JERSEY.
Chairman of the Committee—
THE REV. WILLIAM ARCHIBALD SPOONER, D.D., Warden of New College, Oxford.
Vice-Chairman—SURGEON-GENERAL BRADSHAW, C.B.

The Regular Charge for Patients is **£2 2s.** a week, but the Committee have power to alter the charges at their discretion, as the circumstances of cases require.

The building is arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

The Hospital possesses an Endowment Fund, arising from numerous grants of the late Dr. SAMUEL WILSON WARNEFORD and others. When a reduction of the ordinary charge is asked, a special statement of the circumstances of the Patient must accompany the application for Admission.

For further particulars, apply to the Medical Superintendent, JAMES NEIL, M.D.

THE GRANGE, Near ROTHERHAM,

A SANATORIUM OF THE HIGHEST CLASS FOR THE

CARE & CURE OF MENTAL INVALIDS (LADIES).

Consulting Physician: CROCHLEY CLAPHAM, M.D., F.R.C.P.E.
Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.
Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham), and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at Leavygreave House, Hounsfield Road, Sheffield, by appointment. (Nat. Tel. No. 34, Rotherham.)

GRANGE LANE STATION (M. S. & L. Railway) is within a quarter of a mile of The Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham, changing at Tinsley.

FOR TERMS, FORMS, &C., APPLY TO THE RESIDENT PHYSICIAN.

Croydon Mental Hospital,

UPPER WARLINGHAM, SURREY.

SALUBRIOUSLY SITUATED AT 650 FEET ABOVE THE SEA LEVEL.

PAYING PATIENTS RECEIVED.

Apply to the Medical Superintendent.

East Sussex County Asylum

HELLINGLY MENTAL HOSPITAL.

ACCOMMODATION is provided for PRIVATE PATIENTS in the Hospital at £1 4s. 6d. per week, and in addition two wards of the Main Building have been set aside for the same purpose, at a reduced charge of One Guinea per week for each person from the Administrative County of East Sussex, and £1 2s. 9d. for each person from outside the County, to include all things necessary except clothing.

The main and detached building of this new Institution have been built on the most modern principles, and everything possible has been done to ensure the comfort and cure of those mentally afflicted.

The estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for Children.

For particulars apply to the MEDICAL SUPERINTENDENT.

EMINENTLY SUITED TO THE
— REQUIREMENTS OF THE —
MEDICAL MAN—THE 12 H.P.

INVINCIBLE TALBOT

CAREFULLY PERUSE THESE POINTS:

POWER AND EFFICIENCY.—*The maximum.* The engine is guaranteed to develop more than 25 H.P.

RELIABILITY.—Its absolute reliability has been demonstrated times out of number in endurance tests and under official observation.

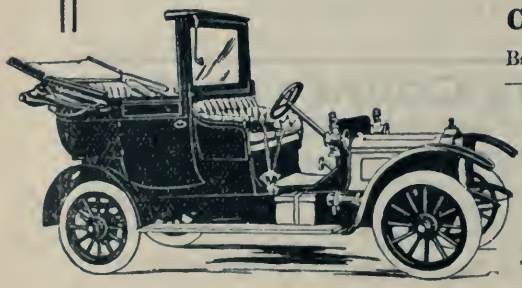
SILENCE.—*Astonishing!* A client writes: "I went to start the engine, but found it running." Its great flexibility makes it a pleasure to drive.

SPEED.—*Marvellous!* Attention is directed to the remarkable list of successes achieved in speed contests on hills and on the flat.

ECONOMY.—Fuel consumption is extremely low; the Car is very easy on tyres, and generally, inexpensive to upkeep—this attested by owners.

Other Models - 15, 25, and 35 H.P.

——— *Catalogues and Specifications on request.* ———



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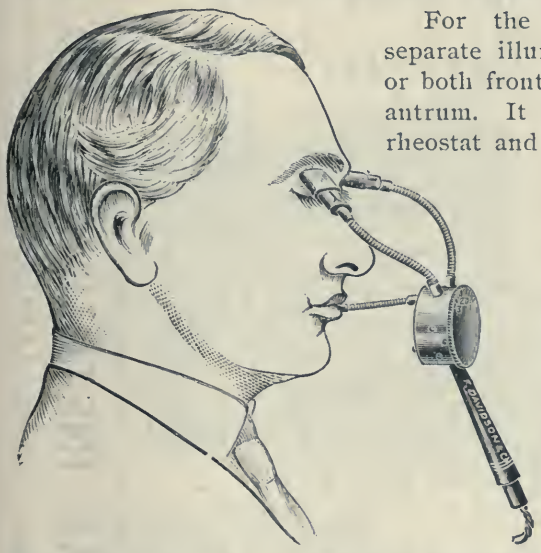
TRANS-ILLUMINATOR

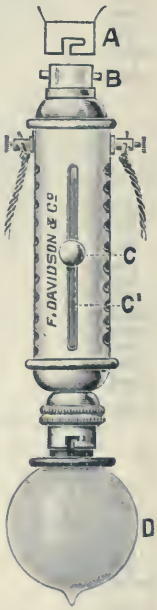


For the simultaneous or separate illumination of either or both frontal sinuses and the antrum. It is controlled by a rheostat and the INTENSITY of light can also be changed.

EVERYTHING
. . . IS . . .
DONE WITH
ONE HAND.

PRICE—
£3 5s.

NEW PORTABLE RHEOSTAT.
No. 80.



For the Illumination of small surgical lamps on the house current; either constant or alternating. It will also provide current for Electrolysis and Cataphoresis with a Galvanometer in circuit.

IT CAN BE CARRIED IN THE POCKET.

Length 6½-in. × 1½-in. diameter,

It can be fitted to any lampholder, a 50 C.P. lamp must be used on a high circuit when it is required to illuminate lamps from 4 to 8 volts. A 32 C.P. lamp is sufficient on low circuit.

Price of Rheostat without lamp ... **45/-**
„ „ with lamp ... **50/-**

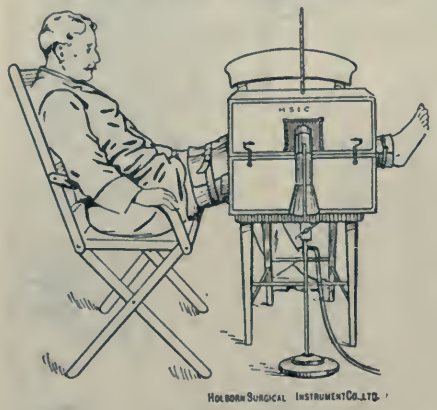
MADE BY—

F. DAVIDSON & CO., 29, Great Portland St., LONDON, W.

Also Makers of URETHROSCOPES and CYSTOSCOPES.

The "Holborn" Hot-Air Chambers.

FOR BIER'S TREATMENT.



These Chambers have been made according to the directions of Professor Bier, and are of the latest improved construction.

They are larger than the old form, as it has been found that a larger volume of heat gives better results.

The reasonable price at which we are now able to make the apparatus, brings it within the reach of all classes, and patients suffering from repeated attacks of rheumatism, &c., can use the chambers in their own homes under the directions of a physician. The openings are lined with a felt cuff to which a band and buckle is attached. It is important that the hot air does not escape through the opening; the limb should therefore be padded with non-inflammable cotton wool, and the buckle drawn sufficiently tight to prevent an escape of hot air, at the same time care must be taken not to impede circulation.

The chambers have vent holes at the top, through which sufficient hot-air escapes to obtain the necessary draught.

A thermometer is fixed in the small hole at the top of the box; the bulb containing the mercury should not touch the sides of the box.

The heat can be regulated by turning the lamp up or down, and by raising and lowering the burner.

The chamber can be immediately cooled by removing the chimney and allowing the cool air to enter.

The Prices of the "Holborn" Hot-Air Chambers are as follows (exclusive of Heating Appliances, *see below*):—

For the Foot, **24/-** Knee, **30/-** Whole Leg, **31/6** Both hips, from **30/-** Elbow, **26/-** Hand, **22/-** Shoulder, **23/-**

Gas Lamp, with funnel and connecting piece, **21/-** Ditto, Spirit Lamp, **20/-**

Thermometer, **1/9** Fire-proofed Cotton Wool, **1/-** per ½-lb. packet.

Illustrated Pamphlet post-free on application to

The HOLBORN SURGICAL INSTRUMENT CO., Ltd.,

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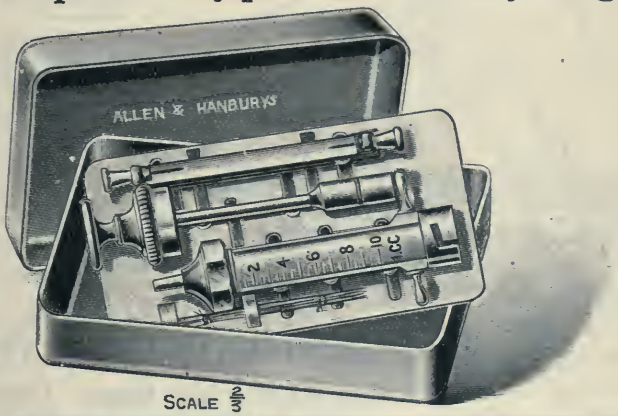
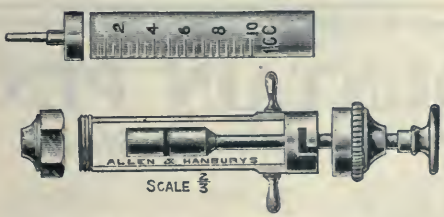
ALLEN & HANBURYS, Ltd., Surgical Instrument Makers,
48, Wigmore Street, LONDON, W.

The "WIGMORE"

Aseptic Hypodermic Syringe



SCALE 3/2



SCALE 2/3

The chief advantage claimed for this Syringe is that a new barrel can be fitted without the trouble of returning the Syringe to the instrument maker. The spare barrels can be kept at hand and in the event of breakage the broken barrel replaced with the new one by simply taking the instrument apart.

Please Note.—When replacing the broken barrel, the metal plunger should be unscrewed from the piston rod and thrown away with the broken glass. The new plunger supplied with the new barrel should then be screwed on to the piston rod. Each plunger is ground to its own barrel and the old is therefore useless.

The prices are as under :—

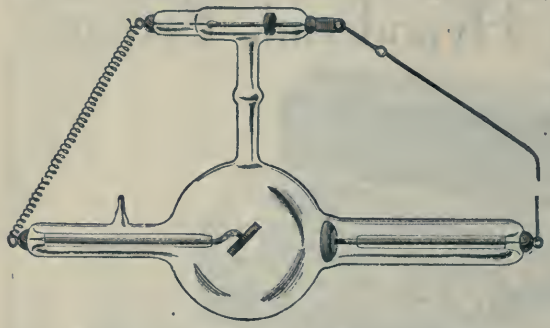
Syringe, 20 minim, complete in nickel-plated case with lift-out frame, with two needles and needle tube ..	10/-
Ditto ditto with spare barrel and metal piston, complete	14/-
Ditto capacity 5 c.c., complete in case	16/-
Ditto .. 5 c.c., with spare barrel	24/-
Ditto .. 10 c.c.	19/4
Ditto .. 10 c.c., with spare barrel	26/8
Spare Barrels with metal pistons, 20 minim	4/-
.. .. .. 5 c.c.	6/8
.. .. .. 10 c.c.	8/-

ALLEN & HANBURYS, Ltd.,
Surgical Instrument and Aseptic Furniture Manufacturers,
48, Wigmore Street, LONDON, W.
City House :—37, Lombard Street, E.C. Works :—Bethnal Green, E.

GREVILLE'S

"Therap" X-Ray Tube

As used by Drs. Sabouraud and Noire, Paris. Also at Bartholomew's Hospital, London; Guy's Hospital, London; London County Council Ringworm Schools; Metropolitan Asylums' Board; Hull Royal Infirmary, etc., etc.



The Ideal Tube for . . Ringworm . . Treatment. . .

PRICE - **33/-**

The vacuum of these tubes remains constant longer than that of any other tube.

One can pass 2 milliampères through these tubes for hours without permanently lowering the vacuum.

Send at once for new catalogue to—

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THE. . .

Latest FOUNTAIN PEN

Special Offer to Medical Men!

ONE of the leading manufacturers of Gold Fountain Pens challenges to demonstrate that their Pens are the best, and have the largest Sale; that no better article can be produced.

They offer to give away the Half-Guinea Diamond Star Gold Fountain Pens for 2/6 each. This Pen is fitted with 14-carat Solid Gold Nib, iridium pointed, making it practically everlasting, smooth, soft, and easy writing, and a pleasure to use. Twin Feed and Spiral, to regulate the flow of ink, and all the latest improvements.

The Self-Filling and Self-Cleaning Perfection Fountain Pen is a marvel of Simplicity; it deserves to be popular. It is non-leakable, fills itself in an instant, cleans itself in a moment—a press, a fill—and every part guaranteed for two years. **The Massive 14-carat Gold** Nib is iridium pointed and will last for years, and improves in use. Fine, medium, broad, or J points can be had.

This Marvellous Self-Filling Pen, worth 15/-, is offered to Medical Men for 5/6. Every pen is guaranteed, and money will be returned if not fully satisfied. Readers of THE MEDICAL ANNUAL desiring a really genuine article cannot do better than write to the Makers—

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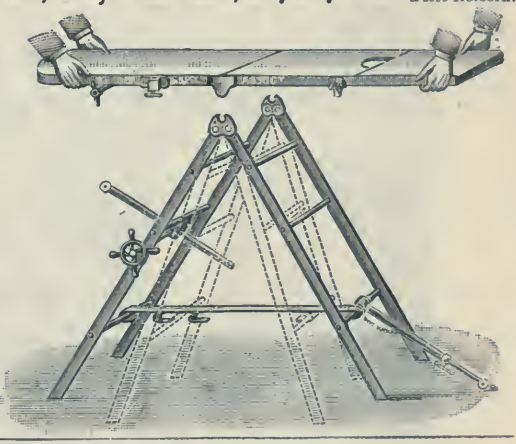

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Operating Tables, cheap pattern, very strong English make, from **£5** upwards.

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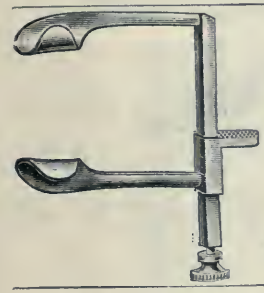

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This Gag holds the mouth open as shown in figure 6225. The advantage of this Gag is that it stands well away from the mouth, and allows the operator the utmost freedom.

Price - - 7/6 each.

PORTABLE ROLL SCREENS,

made of Swedish Pine, with concealed tension spring for holding screen in any position.
Very durable and serviceable.

They can be rolled up when not in use into a very small space.

Sizes	Height -	5ft.	5ft.	5ft.	5ft. 6in.
	Length -	5ft.	5ft. 6in.	8ft. 3in.	6ft. 6in.
	Price -	25/-	32/6	41/6	36/-

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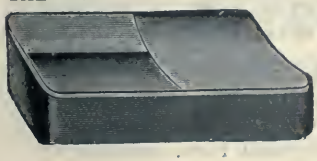
	Length -	8ft. 3in.	10ft.
	Price -	45/6	55/-

Larger sizes supplied to order. Can be had stained in light or dark oak, pitch pine, mahogany, or walnut.

THE "GREVILLITE" BED PAN.



White Earthenware, 5/-; Enamelled Iron, 6/6 each.

"I have had one in pretty hard use for five years, and it is still as good as new. It is unbreakable, absolutely simple, sterilizable, and the most comfortable to lie on that I've ever seen used or ordered to be used. It may be used equally aptly as a bed pan, a douche pan, or a bed bath.

"It is most agreeable to patients, thin slight women, and heavy stout men are equally devoted to it. It has received the enthusiastic commendation of two experienced English nurses who have had an opportunity of working with it.

"Yours truly, C. W. BRANCH, M.B., C.M

"St. Vincent, B.W.I."

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Suggested by Mr. F. T. PAUL, F.R.C.S., of Liverpool.

SIZE—Open, 66 × 18 × 36 in. Closed, 44 × 22 × 6 in.
WEIGHT—43 lbs. In Case, 48lbs.

PRICE—Aluminium painted, £13 13 0 Nickel Plated (dull), £15 15 0
Waterproof Canvas Case, £2 2 0 extra.

GRAND PRIX
(Highest Award)
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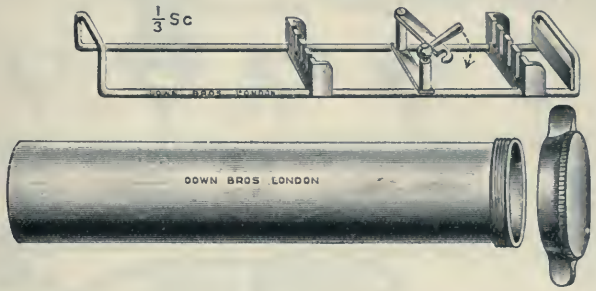
GREIG'S SCALPEL CARRIER.

(Suggested by Mr. D. M. GREIG, C.M., &c., Dundee Royal Infirmary.)

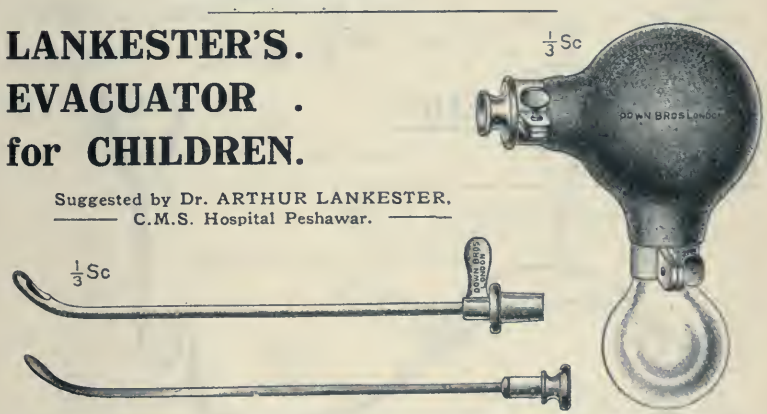
The Scalpels are held firmly in position by means of a lever clamp, they are sterilized and kept sterile by a solution of 1 part Lysol in 12 of Rectified Spirit, they are kept free from rust and retain their original sharpness and polish.



PRICE, for 2 Scalpels, **8/6,** complete with Scalpels **13/6.**
,, 4 Scalpels, **14/6,** ,, ,, ,, **24/6.**

LANKESTER'S. EVACUATOR . for CHILDREN.

Suggested by Dr. ARTHUR LANKESTER,
C.M.S. Hospital Peshawar.



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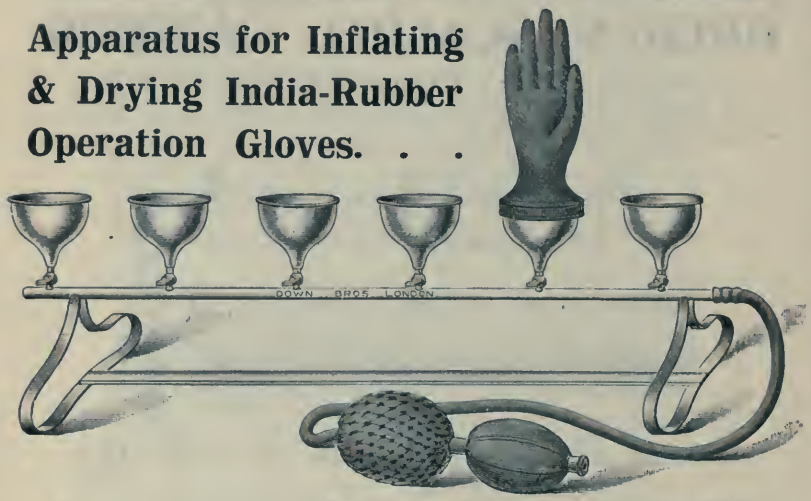

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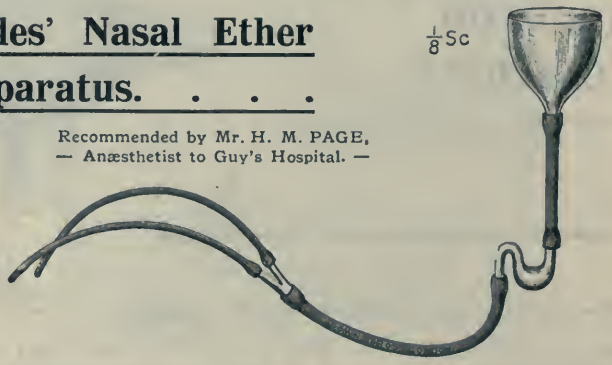

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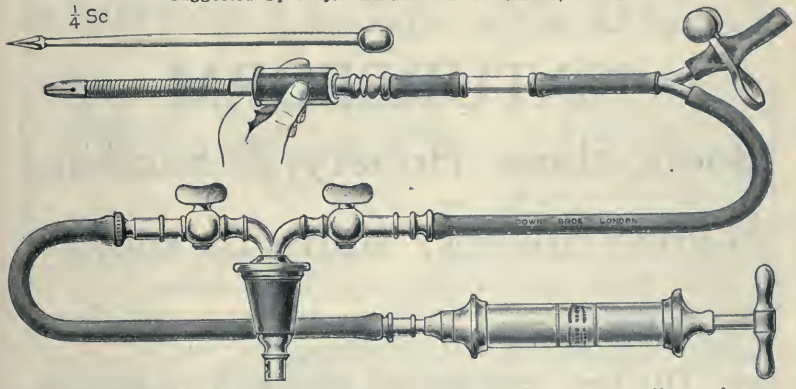

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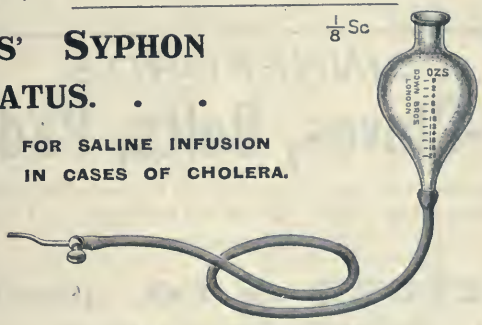

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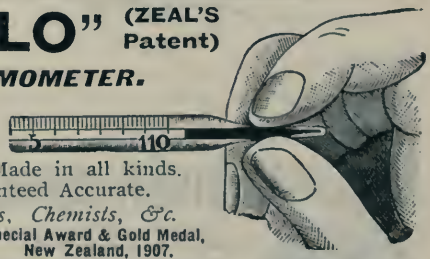

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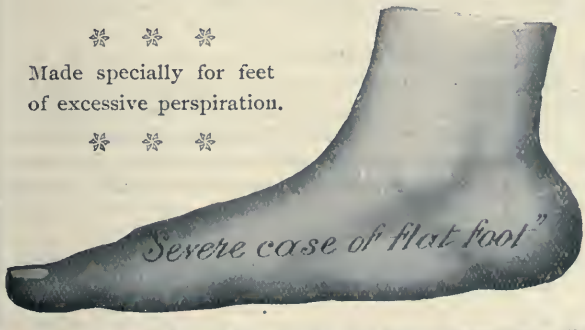

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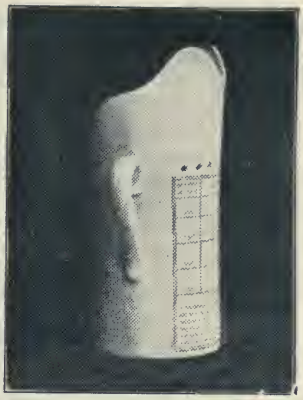

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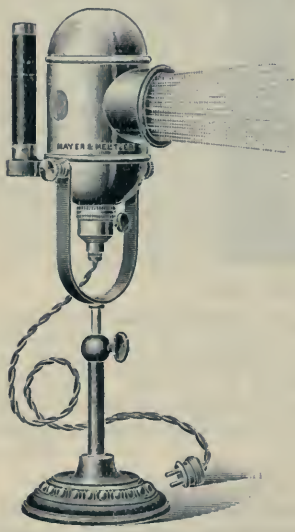

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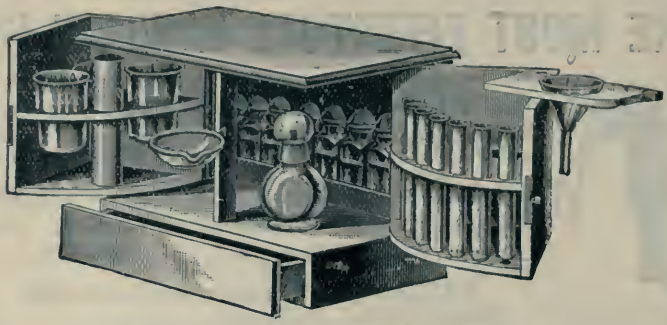

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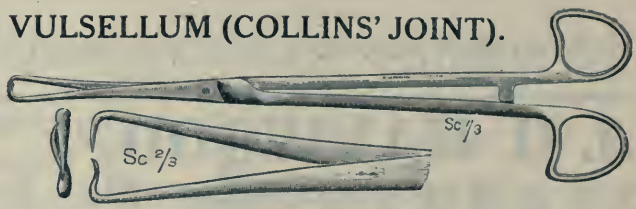

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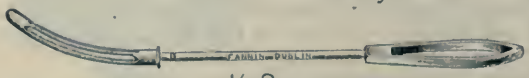

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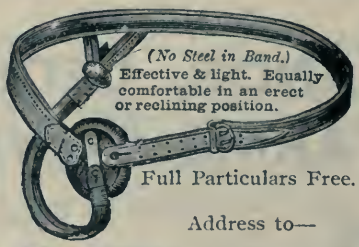

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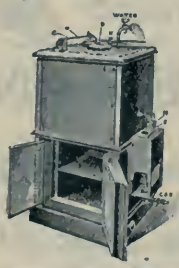

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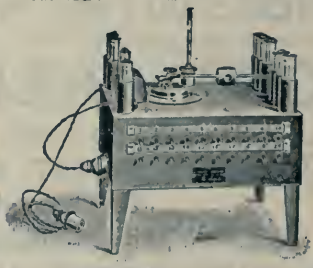

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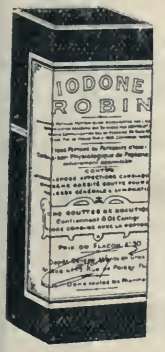

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